

## N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM  
MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT  
CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED  
IN THE INTEREST OF MAKING AVAILABLE AS MUCH  
INFORMATION AS POSSIBLE

November 1980

# **SELECT STATE INLAND WETLAND PROTECTION LAWS**

(NASA-CR-164144) SELECT STATE INLAND  
WETLAND PROTECTION LAWS. A REVIEW OF THE  
STATE LAWS AND THEIR NATURAL RESOURCE DATA  
REQUIREMENTS (National Conference of State  
Legislatures) 99 p HC A05/MF A01 CSCI 05D G3/43

N81-21433

Unclass  
20386

**A REVIEW OF STATE  
PROGRAMS AND THEIR  
NATURAL RESOURCE DATA  
REQUIREMENTS**

Prepared By: Susan B. Klein  
Natural Resource Information Systems Project  
National Conference of State Legislatures



SELECT STATE INLAND  
WETLAND PROTECTION LAWS

A REVIEW OF STATE LAWS AND  
THEIR NATURAL RESOURCE DATA REQUIREMENTS

Prepared By:

Susan B. Klein  
Research Analyst

The National Conference of State Legislatures  
wishes to express its appreciation to the  
National Aeronautics and Space Administration  
for its support and cooperation in producing this document.

### Acknowledgements

The National Conference of State Legislatures wishes to express appreciation to those who provided materials used in this document. Their support and suggestions are greatly appreciated.

### Natural Resource Information Systems Project Staff

Paul A. Tassar:	Director
Loyola M. Caron:	Staff Associate
Susan B. Klein:	Research Analyst

## TABLE OF CONTENTS

I.	INTRODUCTION. . . . .	1
	TABLE I: STATE WETLAND AND FLOODPLAIN REGULATORY PROGRAMS. . . . .	5
	Inland Wetland Protection . . . . .	15
	TABLE II: SELECT STATE INLAND WETLAND LAWS. . . . .	16
II.	NATURAL RESOURCE DATA REQUIREMENTS OF INLAND WETLAND PROTECTION LAWS . . . . .	19
	Major Data Categories . . . . .	28
III.	STATE PROFILES. . . . .	33
	Connecticut . . . . .	35
	Iowa. . . . .	39
	Maine . . . . .	43
	Massachusetts . . . . .	47
	Michigan. . . . .	53
	Minnesota . . . . .	57
	New Hampshire . . . . .	63
	New York. . . . .	65
	Rhode Island. . . . .	75
IV.	APPENDICES. . . . .	79
	Appendix A: State Landsat Applications and Natural Resource Information Systems. . . . .	81
	Appendix B: Legislative Review of Administrative Regulations . . . . .	87
	Appendix C-1: Classification System for Freshwater Wetlands in New York State. . . . .	91
	Appendix C-2: Explanation of Classification Characteristics for Freshwater Wetlands in New York State . . . . .	95
	BIBLIOGRAPHY. . . . .	107

PART I

INTRODUCTION

Widespread public awareness of the importance of guarding our wetland heritage was stimulated by Congressional debates on Section 404 of the Federal Water Pollution Control Act as well as by recent state legislation. In 1977 it became official policy for all federal agencies to conserve and protect wetlands. Under the 1977 amendments to Section 404, states with approved programs could take over the processing of Section 404 permits for the discharge of dredge or fill material in navigable waters of the state, including certain wetlands. At present, no state has assumed administration of the 404 program. Section 208 of the Federal Act also authorized states to develop and implement a "best management practices" program to control certain categories or classes of discharges of dredge or fill material. A state was required, however, to have an approved State 404 permit program prior to requesting approval for a Section 208 program. Regulation of dredging and filling through permits was the primary legal vehicle for protecting wetlands. Some persons were concerned, however, that the scope of Section 404 permitting and the Clean Water Act's definition of "navigable waters" was too broad. This definition, as defined in the federal statute, means "waters of the United States."

State and local agencies, to a varying degree, have acted upon the challenge to preserve wetlands from unnecessary destruction. Adoption of a wetland protection program only partially fulfilled the requirements of the Clean Water Act which requires regulation of all discharges into waters of the United States, not just wetlands. State wetland statutes, therefore, had the opportunity to exceed these minimum requirements by regulating wetland draining and dredging not required by the Act. It was found, however, that although many states afforded some measure of protection for wetland areas through floodplain regulations or through programs for coastal areas, shorelands, scenic and wild rivers or pollution control, few states had programs that adequately dealt with conservation of wetlands. Table I is a general guide to state regulatory programs which affect wetlands or floodplains. It is a revised list taken from the National Wetland's Newsletter, February 1979 issue reflecting state wetland and floodplain regulatory programs through November 1980. Of this listing, only 16 states have adopted legislation specifically regulating development or use of wetlands. Most of the wetland acts apply only to coastal wetlands, several to inland wetlands and three acts apply to both. Many other states are still regulating wetland use through the dredge and fill and/or critical area program. Several offer tax incentives to property owners to encourage protection of wetlands or broader open spaces. Many states have acquired wetlands for park and wildlife purposes and a large measure of wetland protection is achieved by the very restrictive controls applied to floodway areas. Direct floodplain or floodway regulations or state standards for local regulations have been adopted in 24 states but protection of ecological values of wetlands is rarely an explicit objective of these programs. Scenic and wild river programs adopted in one half of the states provide some protection for wetland areas.

TABLE I  
STATE WETLAND AND FLOODPLAIN REGULATORY PROGRAMS\*

ALABAMA

State Coastal Area Board currently developing a coastal management plan. When the plan is put into effect, the Board will issue permits regulating dredge and fill in tidally influenced areas. [ALA. CODE TIT. 8 Sec. 312 - 320.]

---

ARKANSAS

Local units not adopting adequate ordinances regulating activities in floodways and floodplains may be required to adopt and enforce state developed regulations. [ARK. STAT. ANN. Sec. 21-1901 to 21-1904.]

---

ALASKA

State Department of Natural Resources issues permits regulating activities on state-owned land and intertidal zones. [ALASKA STAT. Sec. 38.05330, 38.05070, 38.05107.]

State Department of Natural Resources issues permits to appropriate water, which may become right to appropriation of that water. Wetlands are defined to be waters of the state. [ALASKA STAT. Sec. 46.15030 - 46.15185.]

State Department of Environmental Conservation regulates wetlands through water quality standards and Clean Water Act Sec. 401 certification. [ALASKA STAT. Sec. 46.03100, 46.03110.]

---

ARIZONA

Local units delineate and then regulate floodplains pursuant to Department of Water Resource's guidelines. [ARIZ. REV. STAT. Sec. 45-2341 to 45-2346.]

---

CALIFORNIA

State Lands Commission issues permits and leases regulating dredging, sand and gravel excavation and other activities in any tidal or submerged lands under state ownership. [CAL. GOVT. CODE Sec. 13109, CAL. RES. CODE Sec. 6301 - 6312, 6321 - 6327.]

State and Regional Coastal Commissions issue permits regulating dredge and fill to 1000 yards above mean high tide. [CAL. PUB. RES. CODE. Sec. 3000 - 3900.]

\*Source: "State Wetland and Floodplain Regulatory Programs," National Wetlands Newsletter. February, 1979.



## TABLE I (cont'd.)

State Reclamation Board issues permits regulating dredge and fill activities in the Sacramento-San Joaquin River System and its tributaries. [CAL. WATER CODE pt. 4, Sec. 8520 - 9377.]

San Francisco Bay Conservation and Development Commission issues permits regulating dredge and fill activities in and near San Francisco Bay. [CAL. GOVT. CODE Sec 65600 - 66661.]

Local units regulate activities in state designated floodways pursuant to state minimum standards. Failure to meet state standards results in loss of state funds for flood control projects. [CAL. WATER CODE Sec. 8400 - 8415.]

---

### COLORADO

Counties regulate land use, including floodplain and, to a minor extent, wetland use. State Water Conservation Board designates floodplains and may request county to stop dangerous land uses. State Department of Game and Fish can designate significant wildlife habitat, pursuant to a county request. [COLO. REV. STAT. Sec. 24-65.1-101 et seq.]

State Department of Game and Fish has authority to acquire water rights to protect wildlife by maintaining minimum stream flows, affecting wetlands adjacent to streams. [COLO. REV. STAT. Sec. 37.92.102(3).]

---

### CONNECTICUT

State Department of Environmental Protection issues permits regulating dredge and fill, construction, and other activities in tidally influenced areas. [CONN. GEN. STAT. ANN. Sec. 22a - 28 to 22a - 35.]

Municipalities issue permits regulating most dredge, fill, and construction activities in inland wetlands and water courses. Where local units fail to adopt regulations which conform to state standards, the State Department of Environmental Protection issues the permits. [CONN. GEN. STAT. ANN. Sec. 22a - 36 to 22a - 45.]

State Department of Environmental Protection establishes stream channel encroachment lines based on previously recorded floods. Construction activities within these lines require state permits. [CONN. GEN. STAT. Sec. 25-4a to 25-4g.]

---

### DELAWARE

State Planning Office issues permits regulating activities in coastal zone. Specified heavy industrial development prohibited. Appeal to Coastal Zone Industrial Control Board. [DEL. CODE tit. 7 Sec. 7001 - 7013.]

---

### FLORIDA

State Department of Environmental Regulation issues permits regulating dredge and fill activities adjacent to or in navigable waters and state-owned tidally

TABLE I (cont'd.)

influenced areas. Locals issue permits regulating certain fill activities adjacent to or in navigable waters, subject to approval by Department of Environmental Regulation. State Department of Environmental Regulation district centers are authorized to issue permits for certain minor projects. [FLA. STAT. ch. 253, ch. 403 pt. 5.]

State Department of Environmental Regulation issues permits regulating the construction, modification and expansion of stationary installations which may adversely affect the quality of any waters or bodies of water in the state. [FLA. STAT. ch. 403 pt. 1.]

State Department of Natural Resources manages specified Aquatic Preserves and may establish additional areas. Department of Environmental Regulation may issue permits allowing only certain limited activities in preserve areas. [FLA. STAT. ch. 258.]

State Department of Environmental Regulation issues permits and establishes rules regulating construction activities in a specified area of the coastline. [FLA. STAT. ch. 161.]

State may designate Areas of Critical State Concern. Local regulation of such areas must comply with state development principles. State will regulate areas where local units fail to adopt adequate controls. [FLA. STAT. ch. 380.]

---

GEORGIA

State Coastal Marshlands Protection Committee issues permits regulating dredge and fill in tidally influenced areas. [GA. CODE ANN. Sec. 45-136 to 45-148.]

---

HAWAII

State Land Use Commission issues permits regulating activities in conservation districts, which include some wetlands and floodplains. [HAW. REV. STAT. Sec. 179.1 - 179.4, 205.2.]

---

IDAHO

State Department of Water Resources issues permits regulating dredge and fill in stream channels. [IDAHO CODE tit. 42, ch. 38.]

---

ILLINOIS

Regional Port Districts issue permits regulating dredge and fill activities in navigable waters within the Port Districts. The State Department of Transportation issues permits regulating dredge and fill activities in public waters of the state. [ILL. ANN. STAT. ch. 19 Sec. 65 (Smith-Hurd).]

State issues permits regulating development in delineated floodplains. [ILL. ANN. STAT. ch. 19 Sec. 65(F)(Smith-Hurd).]

---

INDIANA

State Department of Natural Resources issues permits regulating all activities in lakes and their shorelines at or below mean sea level. [IND. CODE Sec. 13-2-11.]

State Department of Natural Resources issues permits regulating activities within the floodway of any stream. Local units regulate floodplains pursuant to state standards. [IND. CODE Sec. 13-2-22.]

---

IOWA

State Natural Resources Council regulates activities in stream channels and floodplains. Municipalities may adopt regulations to administer the program. [IOWA CODE ANN. Sec. 455A.35, 455A.37, 455A.29.]

State Conservation Commission conducted a Protected Water Area Study to develop a plan for the preservation of natural and cultural resources along certain rivers, lakes, wetlands, and adjacent land areas. [S.F. 2267 Sec. 2C and H.F. 734 Sec. 4-1(7)]

---

KANSAS

State Division of Water Resources must approve plans for channel changes, dam construction, and levees and similar structures. [KAN. STATE. ANN. Sec. 82a-301 to 82a-305a (as amended, 1978 Supp.), 24-126.]

Local units regulate activities in floodplains pursuant to state standards. Local ordinances must be approved by State Division of Water Resources. [KAN. STAT. ANN. Sec. 12-734, 12-735.]

---

KENTUCKY

State Department of Natural Resources and Environmental Protection, Division of Water Resources, issues permits regulating construction and other activities which will obstruct the flow of waters in streams and floodways. [KY. REV. STAT. Sec. 151.250, 151.260, 151.310.]

---

LOUISIANA

State Wildlife and Fisheries Commission issues permits regulating the discharge of dredge and fill material in and on banks of streams designated as Natural and Scenic Rivers. Channelization, channel realignment, clearing and snagging, and reservoir construction are prohibited in such streams. [LA. REV. STAT. ANN. Sec.56:1841 - 56:1849.]

State Department of Natural Resources issues permits and grants leases for construction of wharfs, piers, bulkheads, fills, and other encroachments on or reclamation of water bottoms. [LA. REV STAT. ANN. Sec. 41:1131, 41:1701 - 41:1714.]

---

## TABLE I (cont'd.)

### MAINE

State Board of Environmental Protection issues permits regulating dredge and fill and other activities in all tidally influenced areas. Local units may be authorized to issue permits, subject to override of local decisions by the Board. [Alteration of Coastal Wetlands, ME. REV. STAT. tit. 38 Sec. 471 et seq.]

State Board of Environmental Protection (B.E.P.) issues permits regulating alterations of great ponds and lakes. [Great Ponds Act, ME. REV. STAT. tit. 38 Sec. 386 - 396.]

State Department of Inland Fish and Wildlife issues permits regulating dredge, fill, and the erection of permanent structures in, on, over or adjacent to, and affecting, rivers and streams, including contiguous wetlands. Certain dams and crossings are exempt from this regulation. [Alteration of Rivers and Streams, ME. REV. STAT. tit. 12 Sec. 2206 - 2212 (as amended).]

State B.E.P., Land Use Regulatory Commission, in cooperation with the Planning Office, sets standards for mandatory zoning of shoreland areas along the coast, rivers which drain 25 square miles or more, and great ponds. One of the districts, the Resource Protection district, includes shoreland wetlands and floodplains and slopes greater than 25 percent. If local units do not adopt adequate regulations, the B.E.P. or the State Land Use Regulation Commission will. [Mandatory Shoreland Zoning Act, ME. REV. STAT. tit. 12 Sec. 4811 - 4814.]

The B.E.P. and the municipalities issue permits regulating the construction of wharves and weirs in navigable waters. [Wharves and Weirs Act, ME. REV. STAT. tit. 38 Sec. 1021.]

---

### MARYLAND

State Department of Natural Resources issues permits regulating dredge and fill in tidally influenced private areas. State Board of Public Works similarly regulates state tidal areas. [MD. ANN. CODE Sec. 9-101 et seq.]

Department of Natural Resources issues permits for construction of dams and any other obstruction in water courses. [MD. ANN. CODE Sec. 8-901.]

---

### MASSACHUSETTS

Local conservation commissions issue permits either regulating or prohibiting work that could remove, dredge, fill or alter coastal and inland wetlands, land subject to flooding and other areas in the state. Notice and appeal to Department of Environmental Quality Engineering. [MASS. GEN. LAWS ANN. ch. 131 Sec. 40.]

State Department of Environmental Management may issue orders designating specific coastal wetlands and areas subject to flooding in which dredge and fill activities are to be restricted. [MASS. GEN. LAWS ANN. ch. 130 Sec. 105.]

State Department of Environmental Management may designate specific inland waters or wetland areas, including flood-prone areas, and issue orders restricting activities in such areas. [MASS. GEN. LAWS ANN. ch. 131 Sec. 40A.]

## TABLE I (cont'd.)

The state regulates the use of specific floodplains. [MASS. GEN. LAWS ANN. ch. 5-18, 554; Mass. Acts 459, 463.]

---

### MICHIGAN

State Department of Natural Resources issues permits regulating dredge, fill, construction, and other alterations below ordinary high water on inland lakes and streams. [Inland Lakes and Streams Act, MICH. COMP. LAWS ANN. Sec. 281.951 - 281.965.]

State Department of Natural Resources issues deeds, leases, agreements, permits and certificates regulating work on public trust lands below ordinary high water in the Great Lakes. [Great Lakes Submerged Lands Act, MICH. COMP. LAWS ANN. Sec. 322.709, 16.352, 24.102, 24.104.]

State Department of Natural Resources and Water Resources Commission establish comprehensive plan for the use and management of shorelands. Local units adopt ordinances, which must be approved by the state with respect to the regulation of "high risk" (erosion-prone) and "environmental" (important to fish and wildlife) areas. [Shorelands Protection and Management Act, MICH. COMP. LAWS ANN. Sec. 281.631 - 281.645.]

State permits are required for activities in floodway and floodplain areas identified by the state. [MICH. COMP. LAWS ANN. Sec. 323.5b, 560.117.]

The Department of Natural Resources, in cooperation with local units of government, issues permits regulating all alteration activities in all inland wetlands. [GOEMAERE - ANDERSON WETLAND PROTECTION ACT. No. 203, MICH. PUBLIC. ACTS OF 1979.]

---

### MINNESOTA

State Department of Natural Resources issues permits regulating the use of all "public waters" serving a public purpose. Counties may administer the permit program for certain public waters, pursuant to state standards. [MINN. STAT. ch. 105.]

Local units must regulate critical areas designated by State Department of Natural Resources by issuing development permits pursuant to a comprehensive plan. Where local units fail to adopt controls, state regulates areas. [MINN. STAT. Sec. 116G.01 - 116G.14.]

Counties must adopt shoreland zoning consistent with state standards. Where local units fail to adopt adequate regulations, State Department of Natural Resources regulates shorelands. [MINN. STAT. Sec. 105.485.]

Local units issue permits regulating activities in floodplains in conformance to state standards. Where local units fail to adopt adequate regulations, the State Department of Natural Resources regulates floodplains. [MINN. STAT. Sec. 104.01 - 104.07.]

---

## TABLE I (cont'd.)

### MISSISSIPPI

State Marine Resources Council issues permits regulating most dredge and fill activities in tidally influenced areas. [MISS. CODE ANN. Sec. 49-27-1 et seq.]

---

### MISSOURI

Landowners may petition county circuit court for authority to erect a private dam for mills, electric power, or light works across a non-navigable stream. [MO. REV. STAT. Sec. 236.010, 236.020, 236.030.]

Owners of any swamp, wet, or overflowed land have the right to drain or protect the land for sanitary reasons or agricultural purposes with an open ditch, tiles or a levee. [MO. REV. STAT. Sec. 244.010.]

---

### MONTANA

State Department of Fish and Game must give approval of dredge and fill activities by public agencies in stream beds and their immediate banks. [MONT. REV. CODES ANN. tit. 87, ch. 5.]

Local Conservation Districts must give approval of dredge and fill activities in stream beds and their immediate banks for private projects in accordance with state approved rules. [MONT. REV. CODES ANN. tit. 75, ch. 7.]

---

### NEBRASKA

Local units regulate activities in floodways pursuant to state standards. Where local units fail to adopt adequate regulations, state enforces the state standards. [NEB. REV. STAT. Sec. 2-1506.01 to 2-1506.17.]

---

### NEVADA

State Division of Lands issues letters of authorization regulating dredge and fill activities in navigable waters. Permits issued for activities in Lake Tahoe must receive Department of Environmental Protection concurrence. [NEV. REV. STAT. Sec. 321.595.]

State Department of Fish and Game issues permits regulating dredge and fill activities in all streams and their watersheds. [NEV. REV. STAT. Sec. 501.105.]

---

### NEW HAMPSHIRE

State Wetlands board issues permits regulating all dredge and fill activities in tidally influenced areas, and all surface waters flowing and standing (except small ponds). [N.H. REV. STAT. ANN. ch. 483-A, 482 Sec. 41-e to 41-i, 486-A, 149 sec. 1.]

---

TABLE I (cont'd.)

NEW JERSEY

State Department of Environmental Protection issues permits regulating all dredge and fill activities in tidally influenced areas along specified rivers and bays. [N.J. STAT. ANN. Sec. 13:9A-1 to 13:9A-10.]

Department of Environmental Protection issues permits regulating construction of new facilities in coastal areas. Areas regulated under the wetlands act above are excluded. [N.J. STAT. ANN. Sec. 13:9A-1 to 13:9A-21.]

State regulates floodways. Local units regulate floodplains pursuant to state standards. State regulates floodplains where local units fail to adopt adequate regulations. [N.J. STAT. ANN. Sec. 58:16A-50 to 58:16A-66.]

---

NEW YORK

State Department of Environmental Conservation issues permits regulating activities in tidal wetlands. [N.Y. ENVIR. CONSERV. LAW art. 25.]

Local units issue permits regulating activities in freshwater wetlands in accordance with state standards. Department of Environmental Conservation regulates wetlands where local units fail to adopt regulations and in wetland areas of statewide significance. The Adirondack Park Agency regulates activities in wetlands within its jurisdiction. Appeals from local and state issued permits to Freshwater Wetlands Appeals Board. [N.Y. ENVIR. CONSERV. LAW art. 24.]

State Department of Environmental conservation issues permits regulating dredge and fill in wetlands that are adjacent to or contiguous to navigable waters. [N.Y. ENVIR. CONSERV. LAW ART. 15-0505]

---

NORTH CAROLINA

State Department of Natural and Economic Resources issues permits regulating dredge and fill in tidally influenced areas and state owned lakes. [N.C. GEN. STAT. Sec. 113 - 229.]

State Department of Natural and Economic Resources may issue orders restricting or prohibiting dredge and fill activities in coastal wetlands. [N.C. GEN. STATE. Sec. 113 - 230.]

Cities and counties issue permits regulating certain activities in coastal areas of environmental concern (including wetlands) pursuant to state guidelines. State Coastal Resources Commission may develop land use plan and issue permits for such areas if local units fail to adopt adequate plans. [N.C. GEN. STAT. Sec. 113A - 100 to 113A - 128.]

Local units issue permits regulating obstructions in state-identified floodways. [N.C. GEN. STAT. Sec. 143 - 215.51 to 143 - 215.61.]

---

TABLE I (cont'd.)

NORTH DAKOTA

State Water Resources Commission issues permits regulating dikes, dams and other channel modifications in waters of the state, and drainage of certain ponds, sloughs, and lakes. [N.D. CENT. CODE Sec. 61-01-22, 61-02-14, 61-02-20.]

State Health Department regulates discharges into state waters. [N.D. CENT. CODE ch. 23 - 26.]

---

OKLAHOMA

State Water Resources Board issues permits regulating all discharges of dredge and fill material in all waters. [OKLA. STAT. tit. 82 Sec. 926.1 et seq.]

---

OREGON

State Division of State Lands issues permits regulating the removal of material from and the filling in of all natural waterways and their beds and banks. [OR. REV. STAT. Sec. 541.605 - 541.665.]

---



Due to a time constraint, the scope of this report was limited to reviewing selected statewide inland wetlands programs and their natural resource data requirements. The states, the year their laws were enacted or revised, and the relevant statutes are listed in Table II. A detailed description of the selected state programs appears in Part III of this report. Also provided is a review of state Landsat applications and/or information systems which are involved in helping the states to meet natural resource data requirements of inland wetland protection programs (APPENDIX A) and a synopsis of legislative review of administrative regulations (APPENDIX B). Protection of coastal wetlands is usually provided for under a State Coastal Zone Management Program which is often supplemented with a Coastal Wetland Act. For a review of state coastal zone programs, refer to CZM - The States Response : An Assessment of State Coastal Zone Management Programs by Holly Higgins of the Natural Resource Information Systems Project, National Conference of State Legislatures, September 1979.

### Inland Wetland Protection

Interest in wetlands has traditionally been concerned with protecting habitats for migratory waterfowl. In the past few years, however, public interest groups, government agencies and research scientists have recognized that wetland values have a direct bearing on the health and welfare of humans. Some of these values, protected in wetland statutes, are listed below.

Wildlife Habitat - Wetlands provide essential resting, wintering and nesting grounds for many species of migratory waterfowl, other waterbirds and many song birds. They are among the most productive ecosystems in the world. They are also critically important to the continental populations of furbearers.

Pollution Control - The role of wetlands in reducing the pollution levels in waters has recently become one of the most compelling arguments for their preservation. Because wetland ecosystems hold nutrients, they simultaneously act as a pollution filtration system. Water arriving from such "point" sources as wastewater treatment plants and from such "non-point" sources as runoff from agricultural fields and city streets carries a high level of pollutants. As the water circulates through a wetland, the plants take up and use these pollutants as nutrients, significantly improving water quality by increasing the oxygen content and reducing the oxygen load. The capacity of a wetland to use pollutants for healthy plant growth is limited and, if overburdened by pollution, the wetland will be severely changed, particularly if contaminated with toxic substances and poisons.

Flood Control - Wetlands have the capacity to store floodwaters temporarily and in some instances reduce the volume and severity of flood. It has been demonstrated that mainstream wetlands are valuable as natural valley storage basins to reduce downstream flood costs. Reduction in flood crests were related to avoidance of future flood losses in economic terms. Studies have shown that evapotranspirational losses (i.e. loss of water from the soil both by evaporation and by transpiration from the plants growing thereon) from a wetland/vegetation soil complex are greater than that on adjacent open water and can significantly influence stream flow.

TABLE II: SELECT STATE INLAND WETLAND LAWS

<u>State</u>	<u>Year</u>	<u>Statute</u>
Connecticut	1972	Inland Wetlands and Water Courses Act, Conn. Gen. Stat. Sec. 22a-36--22a-45. (Amended through 1978).
Iowa	1979	Protected Water Areas Study, Iowa Code Ann. Sec. 111B.1--111B.13.
Maine	1975	Stream Alteration Act, Me. Rev. Stat. Tit. 12 Sec. 7776-7780.
	1967	Great Ponds Act, Me. Rev. Stat. Tit. 38 Sec. 386-396. (Amended through 1973).
Massachusetts	1972	Wetland Protection Act, Mass. Gen. Laws ch. 131 sec. 40. (Amended through 1979).
	1968	Inland Wetlands Act, Mass. Gen. Laws ch. 131 Sec. 40A. (Amended through 1979)
Michigan	1979	Geomeare-Anderson Wetland Protection Act, Act. No. 203, Mich. Pub. Acts of 1979.
Minnesota	1979	Minnesota Public Waters and Wetlands Permit Program, Minn. Stat. chap. 105.37--105.391 Minnesota's Water Bank Program Minn. Stat. chap 105.392 et. seq.
New Hampshire	1977	Fill and Dredge in Wetlands, N.H. Rev. Stat. Ann. ch. 483-A. (Amended through 1979).
New York	1975	Freshwater Wetlands Act, N.Y. Envir. Conserv. Law Act. 24. (Amended through 1977).
Rhode Island	1971	Fresh Water Wetlands Act, R.I. Gen. Laws Sec. 2-1-18 to 2-1-25. (Amended through 1979).

Groundwater Supply - Freshwater wetlands are popularly regarded as areas that recharge groundwater aquifers. Recharge actually occurs only in special cases; discharge of groundwater to the surface is the most usual wetland event. Studies have shown, however, that in the glaciated north-east, freshwater wetlands may be indicators of geologic conditions that are highly favorable for identifying groundwater supplies. Because of the favorable economics of wells over surface water supplies, protection of aquifers around these wetlands may be an economically important land use policy.

Erosion Control - Marshes and swamps along coasts, rivers and lakes protect shorelines and banks from erosion.

The less tangible values of wetlands may be classified as recreational, educational, scientific and aesthetic.

Recognition of these wetland values assumed formal status when Massachusetts passed the first legislation regulating wetland alteration. Seven states (Connecticut, Massachusetts, Michigan, Minnesota, New Hampshire, New York, Rhode Island) have now passed laws that specifically regulate inland wetland areas, and several states (including Maine, Iowa and Alaska) provide some measure of inland wetland protection through separate statutes or are in the process of developing an inland wetland program.

Statutes authorizing state wetland programs either authorize the regulatory agency to regulate wetlands directly or to adopt minimum standards for local regulation. With the latter approach, the state directly regulates wetland areas only where local units fail to adopt and enforce adequate controls. Many statutes authorize the regulatory agency to undertake a number of additional wetland protection and management functions including data gathering, acquisition of wetlands and providing technical assistance to local government.

Virtually all statutes authorize the state regulatory agency to adopt administrative rules and regulations to supplement statute standards. Where mapping wetlands is required, rules or regulations may be adopted only after the maps are completed.

Inland wetlands have been afforded much less protection than coastal wetlands and are much more varied in physical characteristics, vegetation and use potential. Although the specifics differ, most inland (and coastal) regulatory statutes contain similar types of provisions:

- (1) Legislative findings concerning wetland losses and the need for protection
- (2) A statement of statutory purposes and policies
- (3) Wetland definitions
- (4) Authorization for a designated agency to map wetlands
- (5) Delegation of power to the designated agency to either directly regulate wetland uses or establish standards for regulation by local governments

- (6) A requirement that landowners seek permits for specified kinds of land uses in wetland areas (piers, fills, dredging, structures) from the state agency or local government. The statute usually contains criteria for evaluating permits and procedures for applying for and issuing permits
- (7) Penalties for violating regulatory standards
- (8) Appeal procedures of permits or regulatory orders to a specified court or administrative body. Appeal procedures may establish standards for determining whether a taking of property has occurred and provide remedies.

Most state statutes exempt certain activities from permit requirements. Common exemptions include activities of state and federal agencies, public utilities, local political subdivisions, agriculture, and mosquito control projects.

Non-regulatory wetland protection efforts provide a valuable supplement to inland regulatory programs. Although the present study does not extensively inventory non-regulatory programs, they are commonly a component of one of five types of broader programs:

- (1) Waterfowl and wildlife protection programs
- (2) Public land management programs
- (3) Flood control efforts
- (4) Public education
- (5) Tax incentive programs

Part II

NATURAL RESOURCE DATA REQUIREMENTS OF  
INLAND WETLAND PROTECTION PROGRAMS

Wetland enabling acts contain several types of provisions that directly or indirectly require gathering particular types and scales of data:

- Wetland definitions may indirectly require gathering particular types of data because the regulatory agency must adopt wetland maps and orders complying with statutory definitions.
- Explicit data gathering requirements pertaining to data scale and format may be incorporated into the statute.
- Permit evaluation criteria and procedures may directly or indirectly require the regulatory agency to collect particular data to evaluate individual development proposals in light of statutory criteria.

Wetland data gathering takes two principal forms: (1) preparation of wetland maps and (2) field surveys to determine the impact of proposed development. Although wetland maps have received the widest public attention, program managers often consider field surveys for individual permits to be most crucial in minimizing the impact of development. Most state regulatory programs have prepared formal wetland maps at scales from 1 inch equals 200 feet to 1 inch equals 2,000 feet. Interpretation of black and white air photos is typically used, although other data sources such as soil surveys appear in some efforts. Color and infrared air photos have been applied in some states. New York and Alaska are examples.

The scale of mapping is often an issue. The Connecticut Statute suggests an appropriate mapping scale to be 1 inch equals 200 feet when permit applications are pending. However, not all programs agree with the need for large scale maps. For all other regulatory mapping in Connecticut, a wide range of scale is permitted. Field surveys are needed to resolve boundary disputes and to evaluate development proposals even where very detailed maps are available. Large-scale mapping is very expensive and may create a false impression that wetlands can be located with mathematical certainty.

A second mapping approach advocated by some states is to adopt wetland maps with less initial accuracy and use field surveys to apply vegetative or other criteria to resolve boundary disputes.

Regulatory programs have invariably mapped wetlands on an area-by-area basis (such as one town at a time). A few states have relied solely on vegetative criteria, not mapping, in applying regulations (New York interim regulations for fresh water areas). Only a small number of wetland regulatory programs have completed mapping on a state-wide basis.

Data gathering to analyze individual development proposals is conducted on a case-by-case basis to assess natural values and hazards and the probable impact of the particular development. Site-specific data are usually derived from two sources: (1) information supplied by the developer in his/her application form, environmental impact statement (if one is required), or

special studies; and (2) information generated by the regulatory agency through air photos, topographic maps and other available sources of information, and field surveys. Usually a field investigation is conducted for each permit. A staff engineer or biologist determines the precise wetland boundary and evaluates the probable impact of the project on wetland soils, hydrology, water quality, vegetation, and other parameters. The specific data gathered depends on the proposed project design and the characteristics of the site. Major data deficiencies reported by regulatory agencies often include lack of hydrologic data - to indicate the relationship of the wetland to a groundwater system or the flow regime of surface waters - and lack of wildlife and other ecological data.

State wetland regulatory programs have rarely mapped specific vegetative subzones within broader wetland areas. Identifying specific subzones within particular wetlands is considered by agency staff to be useful, when processing development permits, but also expensive and time-consuming. In addition, attempts to identify subzones may encourage development of less highly regarded areas.

Mapping Wetlands. Mapping of wetlands usually involves a State Board, Agency or its authorized representative to make and revise inventories and maps of the wetlands of the state in cooperation with other state agencies, federal agencies, and local units of government. Maps should set forth boundaries of wetlands using photographic and cartographic standards and techniques. The boundaries should be reasonably clear and accurate and capable of location on the ground either by reference to the maps alone or in combination with field investigations to apply definition criteria. The State Board or Agency may adopt interim maps for areas of special value or hazard, or areas threatened by development until more detailed mapping is possible or practical.

The responsible wetland agency prepares a list of wetland areas to be mapped and recommends priorities in which studies shall be undertaken. The list is revised annually and should consider: (a) degree of damages to lives and property from flooding, erosion, water pollution and other hazards; (b) the value of the wetlands; (c) the rate and type of development taking place; (d) the ability and willingness of political subdivisions having jurisdiction over the area to make use of the data; and (e) other considerations pertinent to the situation. Maps may be prepared separately for various regions of the state. Upon a written request by a landowner whose land or portion thereof, may be included within a wetland, the state agency may delineate more precisely all or a portion of a boundary line or lines on an interim or more detailed map. The more precise delineation should reflect wetland definition criteria contained in the statute and should be of appropriate scale and sufficient clarity to permit the determination of whether or not individual building sites or other sites of proposed regulated activities are included within the wetland.

Improved wetland maps are needed in some states, particularly for inland wetlands. Wetland mapping efforts should, in general, be at a large scale (1:1200 to 1:24,000) and placed on an air photo base to provide specific zone boundaries easily located on the ground. Areas of special hazard and value, such as sites of rare or endangered species, should be identified. However, there are practical limits to map scale and accuracy. Too much emphasis on scale and accuracy may lose sight of the real issue -- the natural resource hazards and values within an area and the degree of control necessary to

protect them. Often areas can be best defined by using both maps and written criteria (vegetation lists), which may be applied through field surveys in case of boundary disputes. In addition, field investigations are essential to evaluate specific proposed developments at particular sites. Original air photos and field notes used in preparing maps should be made available to field personnel to assist detailed, case-by-case field investigations. The Fish and Wildlife Service in cooperation with many states, is currently conducting a National Wetland Inventory which will provide states with much of the needed information.

Enforcement of wetland protection regulations is inadequate in many instances due to lack of imprecise maps. Enforcement could be improved by improved monitoring, and more careful documentation of wetland values and hazards to be used in support of regulations in court. Large-scale air photos taken at periodic intervals and overflights of wetland areas could form important steps in monitoring and enforcement efforts. Site reviews would also be desirable to determine compliance with permit conditions. To facilitate use of data in court, careful records should be kept for all data gathering efforts including (a) dates and locations of data gathering, (b) the parties involved, (c) the methods used, and (d) techniques for storing the data.

Research is needed to improve techniques for evaluating the importance of wetlands to state fisheries, waterfowl, wildlife, recreation, water supply, flood control and open spaces for investigating wetland hazards such as flooding and erosion. Research is also needed for evaluating individual and cumulative impact and to improve monitoring regulatory efforts. Wetland ecosystem and hydrologic system analysis capability should also be improved.

Wetland Definition. The U.S. Fish and Wildlife Service of the U.S. Department of the Interior is currently conducting and updating a nationwide survey of wetlands. The classification system identifies "the single most feature that wetlands share as soil that, at least periodically, is saturated with water." A "wetland" is then described as "land where water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface."

State inland wetland statutes define inland wetlands to include the following elements:

- Relationship to groundwaters, surface waters or floodplains
- Vegetation lists
- Size
- Soil type
- Shoreline element

This definition varies more than coastal wetland definitions which are usually defined through criteria containing two or more of the following elements:

- Tidal action and elevations related to tidal activity
- Vegetation type
- Geographic reference
- Public versus private lands
- Shoreline element
- Size
- Soil type



A study conducted by the Connecticut Water Resource Institute assembled a composite definition drawn from the fields of geology, hydrology, systems ecology, physiological ecology, descriptive botany, zoology, public health, political science and law. The product of the group was a definition emphasizing plant cover and seasonal hydrology which is appropriate for Connecticut and much of the northeast. This definition, similar to those in force in Massachusetts and Rhode Island, lends itself readily to accurate mapping using remote sensing techniques -- especially color infrared aerial photography.

Currently, wetlands in Connecticut are defined only by soil types.\* One of the problems associated with wetlands detection and delineation with the aid of soil maps is that the minimum mapping unit used in such surveys is about two acres. Many forested inland wetlands in Connecticut and in much of Southern New England and neighboring New York State, are smaller than two acres and would simply not be mapped by conventional soil survey methods. Another problem stems from the fact that soil type boundary line locations are often approximations. The true position and width of these lines may range from 10 to 15 feet along sharp breaks in topography and from 70 to 260 feet where more gradual slopes occur. Such rough soil type mappings do not permit precise wetlands delineations.

The use of soils criteria to define inland wetlands in Connecticut is quite well accepted. Soils criteria suggest areas with severe limitations for on-site waste disposal and structural bearing capacity even where wetland plants are absent. However, some local units favor the use of vegetation criteria which has been found quite satisfactory for both inland and coastal wetlands except for areas where natural vegetation had been removed or where listed species are not dominant. Vegetative criteria are particularly useful for identifying coastal wetlands due to the smaller number of species at coastal sites and the clear differentiation of species able to withstand a saline environment. One of the major advantages of using vegetation as the principle criteria for delineating deciduous wetland forests is that differences in species can be recognized both by field surveys and by remote sensing techniques. Information on such plant associations developed from aerial photographs can be digitized for rapid and accurate mapping by computers. These results provide natural resource managers with both information and mapping tools needed to make valid decisions about the future of inland wetlands.

The following matrices portray the major natural resource data requirements extracted from the three prime areas requiring data collection within state inland wetland protection programs:

- Wetland definition
- Maps/Inventories
- Permit applications

Following these matrices is an explanation of what each individual data category entails.

\* The Connecticut Inland Wetlands and Water Courses Act only defines wetlands by soil types. Water Courses are defined by vegetative criteria in addition to other data. Water Courses, as defined, include ponds, marshes, swamps and bogs. Vegetative criteria is used as a component of both definitions when other criteria is unavailable or hard to define.

# MATRIX 1: MAPS/INVENTORIES

	CT	IA	ME*	ME**	MA	MI	MN***	MN****	NH	NY	RI
SOILS	X		X		X	X		X	X		
LAND USE	X	X	X					X		X	
WATER	X	X	X		X	X	X	X	X	X	X
WILDLIFE	X	X	X					X		X	
GEOGRAPHY	X										
TOPOGRAPHY/ SLOPE	X					X				X	
DRAINAGE FEATURES	X		X		X						X
VEGETATION	X	X	X			X				X	X
CULTURAL DATA	X	X								X	
GEOLOGY	X	X	X							X	
LAND OWNERSHIP	X	X	X	X	X	X	X	X	X	X	
SOCIAL/ ECONOMIC	X	X			X				X	X	

\* Maine's Great Ponds Act

\*\* Maine's Alteration of Rivers and Streams Act

\*\*\* Minnesota's Public Waters Permit Program

\*\*\*\* Minnesota's Water Bank Program

# MATRIX II: PERMIT APPLICATIONS

	CT	IA	ME*	ME**	MA	MI	MN***	MN****	NH	NY	RI
SOILS	X		X	X	X			X			X
LAND USE	X		X	X	X	X			X		X
WATER	X		X	X	X	X	X		X		X
WILDLIFE	X		X	X		X			X		X
GEOGRAPHY	X										X
TOPOGRAPHY/ SLOPE	X				X		X				X
DRAINAGE FEATURES	X								X		X
VEGETATION	X				X	X			X		X
CULTURAL DATA	X										X
GEOLOGY	X										X
LAND OWNERSHIP	X	X	X	X	X	X	X	X	X	X	X
SOCIAL/ ECONOMIC	X	X	X		X	X			X		X

\* Maine's Great Ponds Act

\*\* Maine's Alteration of Rivers and Streams Act

\*\*\* Minnesota's Public Waters Permit Program

\*\*\*\* Minnesota's Water Bank Program

# MATRIX III: WETLANDS DEFINITIONS

	CT	IA	ME*	ME**	MA	MI	MN***	MN****	NH	NY	RI
SOILS	X			X			X	X	X	X	
LAND USE		X	X								
WATER	X	X	X	X	X	X	X		X	X	
WILDLIFE		X				X					
GEOGRAPHY		X									
TOPOGRAPHY/ SLOPE		X	X								
DRAINAGE FEATURES	X	X	X								
VEGETATION	X		X		X	X	X		X	X	X
CULTURAL DATA											
GEOLOGY		X	X								
LAND OWNERSHIP											
SOCIAL/ ECONOMIC											

\* Maine's Great Ponds Act

\*\* Maine's Alteration of Rivers and Streams Act

\*\*\* Minnesota's Public Waters Permit Program

\*\*\*\* Minnesota's Water Bank Program

## MAJOR DATA CATEGORIES

### Soils

The main reason for collecting soils data is for wetlands classification. Many statutes use soils data as a major component for defining their wetland resources, and several states base their wetlands definition solely on soils data. In addition, soils data is useful to determine the following criteria:

- The soil erosion factor from adjacent land uses
- The type of vegetative cover the wetland could support
- Soil fertility and productivity
- Properties necessary for restoration of wetlands
- Natural barriers to deteriorating activities
- Sources of nonpoint pollution
- Drainage facilitation
- Aquifer recharge capacity (Recharge occurs if sandy or gravelly alluvial soils at the bottom of a wetland are so pervious as to allow infiltration.)

In order to determine these criteria, the following soils data needs to be collected:

- Type
- Depth
- Slope
- Productivity
- Stabilization factor
- Use
- Sediment yield
- Permeability

### Land Use

In order to determine man-made impacts and/or preserve the existing condition of wetlands, land use data in the form of land use maps and field surveys of prior and current uses must be provided. Often, land use data are used in wetland definition criteria and permit issuance when determining the impact to and preservation of wetland resources (water, vegetation, wildlife, aesthetics, research and recreational values). Land use can have a significant impact on water quality and quantity as well. In order to be accurate, the following data need to be provided:

- Land use maps
- Location of access routes (i.e. roads, channels, boat facilities)
- The most productive uses of the area
- Extent of irreversable damage

In many cases, the availability of land use data is important in determining violations of the state wetland law. Monitoring land use can reveal alteration activities that have occurred since the initial wetland inventory.

## Water/Hydrology

In classifying wetlands, water/hydrology data are a main component. The following data are necessary:

- Changes in water quality and quantity
- Location of surface water drainage channels
- Depth of groundwater
- Pollution control features
- Groundwater recharge capacity
- Flood control features (stormwater retention)
- Stream channel characteristics and diversions
- Floodplain identification
- Number of wetlands and adjacent water bodies
- Water course characteristics
- Size of water body (including depth and volume)
- Natural flow characteristics
- Duration of standing water
- Biological and chemical data (nutrient level, pH of water and other water quality parameters)
- Depth of pervious earth material (to determine if the wetland is connected to an aquifer system and if it significantly contributes to groundwater supply)

Although all of the above data are not necessary in the classification of wetlands, they provide valuable information to:

- Minimize adverse changes
- Determine effects on public water supplies
- Identify recreation, aesthetic and educational uses
- Determine impact from flooding
- Determine ability to provide tertiary sewage treatment through pollution filtration process
- Manage terrestrial and aquatic life and the nutrients needed for their support.

## Terrestrial and Aquatic

The ability of a wetland to support a diversity of aquatic and terrestrial animal species is one of its most important attributes and a major preservation motive. Wetlands provide reproduction areas, food, cover, spawning grounds for fish, habitat, migration stopovers, nesting cover and havens for endangered and/or threatened species. Alteration or destruction of a wetland could result in the loss of habitat, population reduction and/or threaten the presence of an endangered species. In order to achieve more comprehensive management of wildlife populations and monitor effects of alteration activities in wetlands, the following data are necessary:

- Types of species present, especially endangered and threatened species
- Life history data (habitat preference and size, migration patterns, nesting requirements, food and nutrient requirements, reproduction patterns, behavioral characteristics, seasonal needs and changes)
- Condition of species present

- Numbers of species (resident and nonresident)
- Neighboring species (i.e. farm wildlife)
- Disease-bearing or noxious species identification

### Geography

Locational aspects of wetlands are important in:

- Identifying location of wetlands to existing land uses
- Identifying land ownership on permit applications
- Permanently recording location of wetlands
- Identifying boundaries of wetlands and adjacent land areas

Enforcement efforts are more successful when this information is available. In acquiring geographic data, the location and description of the land where the wetland occurs is necessary. In addition, data retrieval is simplified when the geographic boundary of the area is defined.

### Topography

To maintain or enhance the surface contour of the land, topographic data are needed to identify wetlands during periods when little or no water is standing, identify groundwater tables and support field survey data. Topographic data should be in the form of contour maps, slope information and contours of groundwater tables.

### Drainage Features/Watersheds

Alteration of a wetland can hinder a wetland's ability to facilitate drainage. The size, boundary and any other drainage or watershed feature should be monitored.

### Vegetation/Ground Cover

Vegetation data are another prime factor in defining and identifying wetlands. Wetlands are often classified by the type of vegetation present, which also defines the boundary of the wetland. In addition, vegetation provides food, diversity of habitat, cover and spawning and resting areas for fish and wildlife; helps to minimize erosion, provides non-polluting nutrients to food chains, helps determine and, in some cases, improve water quality, and adds to the aesthetic value of the wetland. Vegetation determines the presence and occurrence of groundwater recharge areas. Recharge usually occurs when little foliage is present and there is a decline in transpiration. Preparation of vegetation maps and in-depth monitoring of the following data are required:

- Inventory of all species present
- Determine species diversity
- Status of vegetation (seasonal, endangered, threatened, native, noxious or toxic)
- Duration of growing season
- Productivity
- Physical structure
- Vegetation of adjacent land areas

## Cultural

Cultural values of wetlands are beneficial for education and scientific research efforts. Historical, archaeological and paleontological characteristics provide insight into the activities or concentration of extinct or past life forms (i.e. Native Americans). Often these attributes alone are sufficient reasons for the protection and management of the wetland area and contribute significantly to the aesthetic character of the area. Field studies and historical documents can provide the background for this data category.

## Geology

Where wetlands are associated with, contain, are part of, owe their existence to, or are ecologically associated with unusual geologic features, they comprise integral parts of unusual ecological communities. Damage to these wetlands may result in the loss of valuable species of fish, wildlife or vegetation and is likely to significantly diminish a state's ecological, educational, or aesthetic resources or diminish a variety of the state's or a major region's landforms. These geologic features, if present, contribute significantly to the wetland's stability and therefore, are important factors in determining the value of the wetland. The types of data that resource managers should take note of would include the:

- Unique geologic features (i.e. lakeshores, barrier beaches, sand dunes, eskers, pine barrens)
- Bedrock and geologic conditions (such as subsurface condition, stability analysis, stratigraphic characteristics, hydrologic data)

## Land Ownership

Classifying land ownership, by type (i.e., federal, state, private) is necessary for two reasons. First, permit applications require determination of land ownership and second, statutes usually are authorized to protect and manage all private and/or state-owned lands. Records and/or maps delineating land ownership distribution are necessary and usually available for use in resource management agencies.

## Social/Economic

Social/Economic data provides valuable information in determining the management, preservation, use and classification of a wetland. Certain land uses (urban, mining, agricultural, road maintenance) can influence the quality of a wetland and its resources while others can encourage their use and increase their value. In determining the use, protection and classification of a wetland, it is necessary to identify:

- The recreational values (hunting, fishing, birdwatching, photography, education and research)
- The aesthetic values
- Economic value of adjacent land
- Influence of adjacent land uses
- Mileage from natural area to non-use area



- Financial support of community where wetland protection area is located
- Financial incentives for wetlands protection
- Social benefits of preserved area to the adjacent community
- Economic loss to land owners if discontinuance of previous use (i.e. agriculture, urban development)

While no one has placed a dollar value on wetlands, researchers have developed the following economic indicators:

- Reduction in downstream flood crests were found to be related to avoidance of future flood losses in economic terms. Economists used this loss avoidance data to develop a flood control value of \$1,488 per acre for those wetlands that act as natural valley storage basins.
- Economists have shown that public willingness-to-pay indicators can be used to evaluate freshwater wetlands for both wildlife and aesthetic factors. They examined purchases of wetlands by public wildlife agencies and purchases of wetlands by cities and towns for open space amenities and showed that values of wetlands may be as high as \$1,300 per acre for wildlife and \$5,000 per acre for aesthetics of open space wetlands.

While no dollar figure has been determined, it would be optimistic to suggest that wetlands have a financial value in their ability to

- Recharge and discharge groundwater
- Control pollution and sedimentation
- Store water resources
- Provide forest production
- Act as storm tide buffer
- Provide habitat for commercial species of fish and shellfish

These social/economic values of wetlands have contributed to the development and implementation of statutes designed to help reverse the trend of wetlands conversion and depletion.

PART III  
STATE PROFILES

## CONNECTICUT

**TITLE:** Inland Wetlands and Water Courses Act of 1974  
CONN. GEN. STAT. Sec. 22a-36 - 22a-45

**LEAD AGENCY** Municipal Inland Wetlands Agencies -  
Department of Environmental Protection

**STATE CONTACT:** Doug Cooper, Chief  
Inland Wetland Program  
Water Resources Unit  
Department of Environmental Protection  
207 State Office Building  
Hartford, Connecticut 06115  
203/566-7280

### CONNECTICUT'S WETLAND PROTECTION PROGRAM

#### Introduction

The original Inland Wetlands and Water Courses Act was enacted in 1972. It became effective in February 1974 when regulations were adopted by the Connecticut Department of Environmental Protection (DEP). The law authorizes municipal inland wetland agencies (IWA) to issue permits regulating most dredge, fill, and construction activities in inland wetlands and water-courses. Where local units fail to adopt regulations conforming to state standards, the DEP issues permits. The DEP regulates the same activities, through a separate statute, in tidally influenced areas.

#### Title, Purpose and Outputs Addressed

The Connecticut Inland Wetlands and Water Courses Act of 1974 provides for the protection, preservation, maintenance and wise use of the state inland wetland and water courses by:

- Minimizing disturbance and pollution;
- Maintaining and improving water quality;
- Preventing damage from erosion, turbidity or siltation;
- Preventing loss of fish and other beneficial aquatic organisms, wildlife and vegetation and the destruction of their habitats;
- Inhibiting the danger of flood and pollution;
- Protecting the quality of wetlands and water courses; and
- Protecting the state's potable freshwater supply from drought, overdrift, pollution, misuse and mismanagement by balancing Connecticut's need for economic growth and land use while protecting its environment and ecology.

**PRECEDING PAGE BLANK NOT FILMED**

## Wetland Definitions

The definitions for "wetlands" and "water courses" as used in the statute and regulations are:

"Wetlands" - means land, including submerged land which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial and floodplain by the National Cooperative Soil Survey of the U.S. Soil Conservation Service." The Connecticut Inland Wetlands Act is unique in basing wetland definitions solely on soil types.

"Water courses" - means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, public or private, which are contained within, flow through or border the state of Connecticut."

## Method of Establishing Standards

The Connecticut law is a combination of enabling legislation and legislation specifying (1) regulations for wetlands uses and standards; and (2) authorization to a designated agency to inventory wetlands and water courses. While the Department of Environmental Protection must develop comprehensive programs and promulgate regulations to protect wetlands and water courses where municipalities fail to do so, local inland wetlands agencies are encouraged to develop regulations for activities affecting wetlands and water courses within their jurisdiction. Seventeen town or boroughs and the activities of state agencies in wetlands are regulated by the State Program. Regulations become effective after a public hearing is conducted. No regulated activity can be conducted upon any inland wetland or water course without a permit. The local inland wetlands agency or the Department must establish or amend area boundary maps in accordance with the wetland regulations. The inventory or index of the wetlands and water courses must include pictorial representation. In the fall of 1980, the Natural Resources Center of the DEP will be cooperating with the U.S. Fish and Wildlife Service in conducting a comprehensive inventory of the state's inland wetlands. A scale of 1:80,000 black and white quad-centered aerial photographs will be used to produce 1:50,000-scale maps. Because the wetlands will be defined by a combination of factors which will be principally vegetative, this mapping will not be suitable for statewide regulatory purposes. However, when completed, the state will have its first comprehensive inventory of wetlands enabling the monitoring of changes from natural and man-made causes.

## Responsible Agency and Method of Administration

The law is administered by the Commissioner of the DEP. The DEP regulates 17 towns which do not have municipal wetlands agencies, and all activities within inland wetlands and water courses proposed by state departments or agencies. Both the DEP and local inland wetland agencies exercising their statutory authority are empowered to review and regulate a proposed activity within a wetland or water course to access and control the impact which the activity may have on water quality, wildlife and other resources. Any person proposing to conduct a regulated activity upon an inland wetland must file an

application with the appropriate agency. Applications must include the following information:

- Name, address and phone number of the applicant or owner
- The applicants interest in the land
- The geographic location of the property including a detailed description of the land
- Purpose and description of proposed activity
- Names of adjacent property owners

The Commissioner of the DEP determines those activities applied for which can involve a significant impact on a wetland or water course and thus require additional information which can include:

- A site plan
- Soil sample data
- Stream or river channel data
- Biological information
- Downstream concerns including channel characteristics
- Water course characteristics
- Analysis of material to be deposited
- Description of construction activity
- A list of property owners who might be threatened by the activity

The DEP or IWA may hold a public hearing on pending inland wetland applications. Assistance and recommendations in reviewing applications may be accepted from the county soil and water conservation district or the local conservation commission of an adjoining municipality.

In making a final decision on a permit application, the DEP or local IWA must consider the environmental impact of the proposed action including:

- Effects of the wetlands or water courses capacity to support biological life, prevent flooding, supply water, control sediment, facilitate drainage and promote public health and safety
- Alternatives to the proposed activity which might enhance environmental quality or have a less detrimental effect
- The relationship between the short-term uses of the environment and the maintenance and enhancement of long-term productivity
- Irreversible and irretrievable commitments of resources
- Character and degree of injury to the property
- The suitability of the proposed action

#### Applicability and Exemptions

The law applies to all non-federal public and private wetlands and water courses. The following operations and uses are permitted:

- Grazing, farming, nurseries, gardening, and harvesting of crops and farm ponds of three acres or less
- Residential home activities for which a building permit has been issued or are conducted on a subdivision lot
- Boat anchorage or mooring

- Uses incidental for the enjoyment and maintenance of residential property
- Construction and operations by water companies

The following are nonregulated uses provided they do not disturb the natural and indigenous character of the wetland or water course by removal or deposition of material, alteration or obstruction of water flow or pollution of the wetland or water course:

- Conservation of soil, vegetation, water, fish, shellfish and wildlife
- Outdoor recreation

### Violations and Penalties

If the appropriate IWA finds a person is conducting an activity which is in violation of the law, the agency may issue a written order to the violator to immediately cease the activity or correct the condition. Any person who willfully commits a violation will be fined not more than \$1,000 for each offense. The money collected is used to restore the affected wetland or water course to its prior condition.

### Regulations

The local IWA or DEP regulates those activities which remove material from, deposit material in, obstruct, alter, or pollute inland wetlands and water courses.

The Commissioner of the DEP regulates the following activities to the exclusion of the local IWA:

- Construction or modification of any dam
- Construction or placement of any obstruction within channel encroachment lines
- Construction or placement of any structure or obstruction within tidal, coastal or navigable waters
- Division of water for public and domestic use
- Discharges into waters of the state

## IOWA

TITLE: Protected Water Area Study  
S.F. 2267 Sec. 2C (1978)  
H.F. 734 Sec. 4-1(7) (1979)

LEAD AGENCY: State Conservation Commission

STATE CONTACT: Kevin Szcodronski, Outdoor Recreation Planner  
Iowa Conservation Commission  
Wallace State Office Building  
Des Moines, Iowa 50319  
515/281-8674

### IOWA'S PROTECTED WATER AREA PROGRAM

#### Introduction

Iowa does not have an enabling act for the protection of wetlands. Very little of the state's existing legislation specifically protects, preserves, and enhances the natural character of the land areas adjacent to lakes, rivers, and marshes. Current water resource legislation in Iowa concentrates on managing the water bodies themselves by regulating water availability, water quality and water course alteration. In recognizing the need to enact new legislation to insure more comprehensive management of the state's water resources, the state legislature has been involved in several efforts. In 1978 and 1979, the state legislature authorized an appropriation to the Iowa Conservation Commission (ICC) for the establishment of a Protected Water Areas (PWA) Study aimed at identifying and developing workable methods to preserve, protect and enhance a limited number of the more outstanding native areas adjacent to the state's rivers, streams, marshes and natural lakes. The intent was to develop a PWA program to manage the designated areas with emphasis placed on the protection of the state's natural resources, including wetlands. The program will compliment the existing water resource legislation by managing the land areas adjacent to the water bodies.

Since the idea of a PWA Program was first conceived, the Iowa Conservation Commission has emphasized the need to coordinate existing legislation and management programs to implement a PWA Program in Iowa. One initial effort would be to amend the Iowa Scenic Rivers Act to include protection of lakes and marshes in addition to the protection it provides for rivers. Additional alternatives presently available to resource managers could also help to meet the needs identified in the PWA study. The alternatives available could include the following mechanisms and supportive legislation:

- Fee Title
- Land Acquisition
- Conservation Easements

"natural" state (i.e. naturally vegetated with little agricultural, residential, or urban development).

## Step 2 - Statewide Water Areas Land Use Survey

By using its statewide computerized data file, the LUAL depicted stream size and adjacent land uses for all the interior rivers and streams in Iowa that were determined as being in a "natural state.". The land uses that were delineated included urban, agriculture and forest.

The LUAL indicated that the use of their land use data file would be impractical to evaluate Iowa's border rivers, cold water streams, lake shorelines and wetlands. Therefore, selected ICC staff members were asked to identify "top candidates" for possible inclusion in a PWA system.

A map was then drawn delineating seven landform regions and identifying all the water areas in Iowa which the LUAL and the ICC determined to have sufficient qualities to be included in step 3 of the PWA evaluation process.

## Step 3 - Aerial Photo Interpretation

Quarter-county aerial photo mosaics were used by the LUAL to evaluate in more detail those water areas identified during step 2. Every mile of river and stream and every quarter-mile of lake and wetland shoreline is being scored separately, based upon the following criteria:

- Depth and length of tree cover
- Human alignment alterations (channelization, shoreline extension, etc.)
- Presence of impoundments
- Crossings (roads, railroads, utility lines)
- Parallel roads, railroads, utility lines
- Structures (houses, cabins, barns, sheds, etc.)

The scores were tabulated and used to more specifically identify those stretches of water areas within each landform region which warrant further consideration during step 4 (field inspections).

The LUAL evaluated 3,255 miles of rivers and streams and 27 lake and marsh shorelines with the use of aerial photography. Ten to fifteen percent of those areas, within each landform region were recommended for further evaluation. Field inspections were made of these areas and minor changes were made.

## Step 4 - Field Inspections

Field inspections and analyses were conducted by the ICC on all areas remaining for further consideration at the end of step 3. The following criteria were considered:

- Visual impacts of the criteria used during step 2
- Geologic, historic, archaeological, cultural, and recreational significance

PRECEDING PAGE BLANK NOT FILMED



- Water quality
- Wildlife and plant species (i.e. endangered, unique, etc.)
- Local public support
- Regional priorities for water oriented recreation and preservation facilities (as identified by ICC's Statewide Comprehensive Outdoor Recreation Plan (SCORP))

"Potential lift-off areas" (areas which merit protection) were identified in each landform region and will eventually be recommended to the legislature for development of detailed protection plans. The potential lift-off areas will be selected based upon the following criteria:

- Natural and cultural resource areas of archaeological, geologic, historic and educational significance, vegetation and wildlife
- Public response and support
- Intensity of agricultural and residential encroachment
- ICC staff recommendations
- LUAL recommendations
- County Conservation Board receptiveness
- Statewide distribution
- Present land ownership

#### PWA General Plan

The end product of the PWA Study was the Statewide General Plan which formulates a program to preserve some of Iowa's natural and scenic lake shorelines, river corridors and marshes. In December 1980, the General Plan was completed addressing legislation needs and alternatives. Suggestions for changes to the existing Scenic Rivers Act is included in the General Plan. After the ICC approves the recommendations, the plan will be submitted to the legislature. The completion of the General Plan marks the end of the PWA Study and, hopefully, the beginning of a PWA Program in Iowa. Since there are a number of existing statutes already protecting the state's water resources, the PWA General plan will recommend coordination of existing legislation. In this effort, the PWA General Plan will support the need for the Wetlands Tax Incentive Bill.

#### Proposed Wetlands Definition

As initially defined, "wetlands" will mean land preserved in its natural state which is mostly under water, produces little economic gain, and has no practical use except for wildlife or water conservation purposes, drainage of which would be lawful, feasible and practical and would provide land suitable for the production of livestock, dairy animals, poultry, fruit, vegetables, forage and grains." "Wetlands" includes adjacent land which is not suitable for agricultural purposes due to the presence of the land which is under water.

## MAINE

**TITLE:** Stream Alteration Act  
ME. Revised Stat. tit. 12 Sec. 7776 - 7780 (as amended)  
Great Ponds Act  
ME. Revised Stat. tit. 38 Sec. 386 - 396

**LEAD AGENCY:** Department of Inland Fisheries and Wildlife (Stream Alteration Act)  
Board of Environmental Protection (Great Ponds Act)

**STATE CONTACT:** Ken Anderson, Chief  
Planning and Coordination Division  
Department of Inland Fisheries and Wildlife  
284 State Street  
State House Station 41  
Augusta, Maine 04333  
207/289-3286

Arthur Dutton, Environmental Specialist  
Bureau of Land Quality Control  
Department of Environmental Protection  
State House Station 17  
Augusta, Maine 04333  
207/289-2111

### MAINE'S INLAND WETLAND PROTECTION PROGRAM

#### Introduction

Maine regulates inland wetlands through the Stream Alteration Act and the Great Ponds Act. A description of these statutes is provided for in this section. Briefly, the State Department of Inland Fish and Wildlife issues permits regulating dredge, fill and the erection of permanent structures in, on, over or adjacent to, and affecting:

- Rivers, streams, and brooks
- Natural bodies of water contiguous to rivers, streams and brooks having surface areas under 10 acres
- Artificial impoundments having surface areas under 30 acres

Protection of inland bodies of water which in their natural state have a surface area in excess of 10 acres or are artificially formed and have a surface area in excess of 30 acres, the shore of which is owned by 2 or more persons, is provided for in the Great Ponds Act. The State Department of Environmental Protection issues permits regulating activities below the high water line (HWL) in the above bodies of water. The Great Ponds Act was passed in recognition that existing water related environmental statutes and programs were basically developed for free-flowing bodies of water and were not adequate for protection of great ponds.

Some additional protection of inland wetlands is also provided for in Maine's Mandatory Shoreland Zoning and Subdivision Control Act (Title 12, Chapter 424). Shoreland areas defined as land within 250 feet of the normal high water mark of any pond, river or salt water body are subject to zoning and subdivision controls under this Act. Municipal governments are authorized to plan, zone and control the subdivisions of land. This jurisdiction often includes the shoreland areas of inland bodies of water protected under the Great Ponds Act and Stream Alteration Act. While local jurisdiction is limited to the shoreland of zoned areas, some overlapping does occur. Most shorelands of great ponds, as defined, have been zoned.

### Stream Alteration Act

This Act declares it unlawful to dredge, fill or erect a permanent structure in or on any river, stream or brook, as defined, or on the land adjacent to these waterways in a manner that any dredged spoil, fill or structure may fall or be washed into these waters. A permit must be obtained before any of these activities can be conducted. In order to obtain a permit through the Department of Inland Fish and Wildlife, the proposed activity must not:

- Unreasonably interfere with existing recreational and navigational uses
- Cause unreasonable soil erosion
- Unreasonably interfere with the natural flow of any waters
- Unreasonably harm any wildlife habitat
- Lower the quality of any waters

While wetlands are not specifically defined in this statute, non-permanent or intermittent water courses are included in the definition of rivers, streams or brooks. According to this definition, "river, stream, or brook" means a channel between defined banks created by the action of surface water and characterized by the presence of a bed, devoid of topsoil, containing water-borne deposits on exposed soil, parent material or bedrock.

The law does not apply to river, stream or brook crossings in connection with public work projects which alter no more than 300 feet in any mile of shore nor to private crossing or dam projects which alter not more than 300 feet in any mile of shore. Alterations to both shores of the river, stream or brook are combined in arriving at the total shore footage.

Emergency repairs, maintenance of railroad structures, track or roadbed within the located right-of-way of any railroad are also exempt from the law.

### The Great Ponds Act

#### Title, Purpose and Outputs Addressed

The Great Ponds Act states that great ponds provide great scenic beauty and unique characteristics, recreational, cultural, historical and environmental values of present and future benefit. In fear that uses are causing the rapid acceleration of eutrophication of these ponds, the Great Ponds Act provided for development of a statewide program, in coordination with other state water resource programs, to protect and reclaim the water quality of the great ponds. This program is designed to facilitate research, develop programs and establish environmental standards to prevent the degradation and encourage the enhancement of these great ponds.

## Great Ponds Definitions

As defined in the Statute, "great pond" includes any body of water which in its natural state has a surface area in excess of 10 acres, any body of water artificially formed or increased which has a surface area in excess of 30 acres, the shore of which is owned by two or more persons, firms or other legal entities.

"Normal high water line" means that line which is apparent from visible markings, changes in the character of soils due to prolonged action of the water or from changes in vegetation from predominantly aquatic to predominantly terrestrial. All land below the normal high water line is considered the bottom of the great pond.

## Method of Establishing Standards

The Maine law is an enabling law authorizing the Board of Environmental Protection to establish criteria classifying great ponds according to their trophic conditions and stages of trophic development. This classification has been established for all surface waters in the state. In establishing such criteria, the Board must consider the size, depth and volume of the ponds, the number, size and flow of inlets and outlets, the size of drainage areas, stratification, geology, aquatic plant and animal life and other appropriate physical, chemical and biological characteristics and the statutory water quality classification of these ponds. The Board may also establish guidelines for waste control systems to control, abate and prevent environmental damage to great ponds in each category. The Board is authorized to promulgate regulations designed to reduce procedural requirements and establish standards for those alterations which have no significant impact upon the great ponds.

The Department of Environmental Protection can maintain, in cooperation with other state agencies, a data bank containing all the known information pertaining to all great ponds within the state. Such information is made available from all agencies possessing information relating to great ponds. The DEP is authorized to conduct research and studies to determine how water quality in great ponds can be restored and enhanced.

## Responsible Agency and Method of Administration

The law is administered by the Department of Environmental Protection. Proposed alteration activities require application of a permit to the Board of Environmental Protection before the activity can commence. The following are regulated activities:

- Dredging or removing materials from below the normal high water line
- Constructing or repairing any permanent structure below the normal high water line
- Depositing any dredged spoil or fill material below the normal high water line
- Bulldozing or scraping on land adjacent to a great pond so that material may fall or be washed into a great pond

A permit will be granted by the Board, in consultation with local municipalities, if the proposed activity will not unreasonably:

- Interfere with existing aesthetic, recreational, navigational or scenic uses
- Harm the natural environments of the great pond or of any stream flowing into or out of the pond
- Cause soil erosion
- Harm any aquatic or wildlife habitat
- Interfere with the natural flow of any waters
- Lower the quality of the water

Enforcement is delegated to inland fish and game wardens, coastal wardens and all other enforcement officers.

#### Applicability and Exemptions

The law applies to all great ponds, as defined, in the state. Alterations which have no significant impact upon great ponds are exempt from the law. This includes:

- Placement of water lines to serve a single family house
- The movement of rocks or vegetation by hand over a shore front length less than 10 feet
- The placement of sand above the high water line
- The construction of rock riprap erosion control devices above the high water line
- Installation of anchoring devices
- Installation of cables for utilities

#### Violation and Penalties

Any person who violates the law is guilty of a class E crime and punishable by a maximum fine of \$25,000.

## MASSACHUSETTS

**TITLE:** Wetland Protection Act of 1972 (As amended through 1979)  
Mass. Gen. Laws ch. 131 Sec. 40  
The Inland Wetlands Act of 1969 (Amended through 1979)  
Mass. Gen. Laws ch. 131 Sec. 40A

**LEAD AGENCY:** Ch. 131 Sec. 40-through Department of Environmental Quality  
Engineering in cooperation with local conservation  
commissions  
Ch. 131 Sec. 40A - through Department of Environmental  
Management

**STATE CONTACTS:** Roderick Gaskell, Acting Director  
Division of Wetlands Protection  
Department of Environmental Quality Engineering  
Leverett Satonstall Building  
100 Cambridge Street  
Boston, Massachusetts 02202  
617/727-9708

Sheldon Shapiro, Director  
Wetlands Restriction Program  
Department of Environmental Management  
100 Cambridge Street, Rm. 1904  
Boston, Massachusetts 02202  
617/727-8893

### MASSACHUSETTS WETLANDS PROTECTION PROGRAM

#### Introduction

For many years Massachusetts has recognized wetlands as important to the economic and environmental health of the state. The first Inland Wetlands Protection Law, the Hatch Act, passed in 1965 making Massachusetts the first state to pass legislation regulating wetlands alteration. At that time, the program was administered through the Department of Natural Resources (DNR). The program has been reorganized, refined and improved to its present form since this Act was passed. In 1972, the Hatch Act was combined with the Jones Act, an Act passed in 1963 to regulate dredge and fill activities in coastal wetlands. The union of these Acts formed the present State Wetland Protection Act now administered through the Department of Environmental Quality Engineering (DEQE) and providing for local regulation or prohibition of any alteration activity in all inland and coastal wetlands, lands subject to flooding and other areas of the state.

In carrying out its responsibilities under the Wetland Protection Act, DEQE's goal is to protect certain environmental resources and preserve wetland resources through a program that includes helping conservation commissions administer the Act, reviewing local orders of conditions developed by conservation commissions, and serving as the appeal agency in a wetland case, if necessary.

The law authorizes local conservation commissions to regulate work that involves filling, removing, dredging or otherwise altering wetlands. Such activities are subject to an "Order of Conditions" issued to the person proposing the work by the local conservation commission. The Act seeks to protect important resources, and by law encompasses the following six interests: public and private water supply, flood control, storm damage prevention, prevention of pollution, protection of land containing shellfish, and protection of fisheries. This entire program has served as a model for many other states interested in enacting wetlands legislation

In addition to the Wetland Protection Act, an Inland Wetland Act was passed in 1969 authorizing the State Department of Environmental Management (DEM) to designate specific inland waters or wetlands, including flood prone areas, and issue orders restricting activities in these areas. The Act authorizes the DEM to determine significant wetlands to be permanently restricted from dredging, filling and other development activities. The Inland Wetland Act established a tax incentive program to encourage private citizens to protect their land without loss of value, enjoyment or title by allowing them to transfer or sell their development rights to local communities or a private trust. This insured the private citizen and the DEM that the wetlands existing on the landowners property will remain open and undeveloped. Certain activities permitted through DEM, however, may still require a DEQE permit.

#### Wetland Protection Act

##### Title, Purpose and Outputs Addressed

The Massachusetts Wetland Protection Act protects the following wetlands from removal, filling, dredging or other alteration activities:

"bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or any estuary, creek, river, stream, pond, lake or any land under these waters or any land subject to tidal action, coastal stream flowage, or flooding."

##### Wetlands Definition

"Freshwater wetlands" means wet meadows, marshes, swamps, bogs, areas where groundwater, flowing or standing surface water or ice provides a significant part of the supporting substrate for a plant community at least five months of the year; emergent and submergent plant communities in inland waters; that portion of any bank which touches inland waters.

##### Method of Establishing Standards

The Massachusetts Wetland Protection Act authorizes the Commissioner of the DEQE to promulgate rules and regulations for protection of wetlands. Regulations are provided separately for inland and coastal wetlands. The DEQE or local conservation commission must establish a significant standard for the concerned area to determine if it is in the public interest. This standard must include one or more of the following factors:

- (a) Any actual or potential contamination to public, private or groundwater supply including aquifers or recharge areas, land containing shellfish and fisheries including the biological life necessary to support either a freshwater or coastal wetland ecosystem;

- (b) Any reduction of the flood storage capacity of a freshwater wetland, river, stream or creek;
- (c) Any alteration of a river, stream or creek that results in any increase in the volume or velocity of water which may cause flooding;
- (u) Any actions which will remove, fill, dredge or alter any area subject to the Act and will result in any threat to the health, welfare and safety of the individual or the community;
- (e) An area consisting of "very poorly drained soil" as described by the National Cooperative Soils Survey of the U.S. Department of Agriculture (USDA) Soil Conservation Service;
- (f) An area which would be flooded as a result of a 100-year storm as that storm is defined in the U.S. Department of Commerce Technical Paper No. 40 or has been designated in a town by-law as part of a 100-year flood plain; and/or
- (g) An area which is designated a wetland or floodplain on a restrictive map approved by the conservation commission.

#### Responsible Agency and Method of Administration

As mentioned, the Act is administered by the DEQE and local conservation commissions. Local commissions issue permits regulating dredge and fill activities in all wetlands. Notice and appeal is through DEQE.

Any person who intends to alter any wetland must file a written "Notice of Intent" with the conservation commission including plans describing the activity and its effect on the environment. No work proposed in a "Notice of Intent" may begin until after the final order, determination or notification with respect to such work has been given and until all other required permits and approvals have been granted. An environmental data form must also be filed. This form should include a description of the property involved and a description of modifications proposed on the site including grading, dredging, removal of vegetation, etc. The following data are required:

- A. Soils - USDA soil types, soil permeability, percolation rate.
- B. Surface Waters - distance of site from nearest surface water, sources of runoff, runoff rate, runoff water destination, chemical additives to runoff water.
- C. Ground Cover - extent of existing impervious ground cover, proposed impervious ground cover, existing vegetation cover, proposed vegetation cover.
- D. Topography - maximum existing elevation, minimum existing elevation, maximum proposed elevation, minimum proposed elevation, description of proposed change in topography.
- E. Groundwater - minimum depth to water table, maximum depth to water table, seasonal maximum groundwater elevation.
- F. Water Supply - source of water to be provided, expected water requirements, water uses.
- G. Sewage Disposal System - description and location of system, expected contents of the sewage effluents (human waste, pesticides, detergents, oils, heavy metals, other chemicals), expected daily volume of sewage.



- H. Solid Waste - estimated quantity of solid waste to be developed, method of disposal, plans for recycling.
- I. Boat Yards, Docks, Marinas - capacity, description of docks, floats, sewage pumpout, fueling facilities, fuel spill prevention measures and equipment.
- J. Impact of Proposed Action Applied For - effects on plant species and marine species, drainage and runoff, siltation of surface waters, groundwater quality, and surface water quality.
- K. Alternatives to Proposed Action - describe alternatives and benefits of requested actions.

### Applicability and Exemptions

According to the Act, the program applies to three types of areas:

- 1) any "bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or on any estuary, creek, river, stream, pond, or lake," 2) "any land under these waters," and 3) lands subject to tidal action, coastal storm flowage, or flooding".

Typical activities regulated by the Act include filling, clearing land, removing muck or peat, grading, digging gravel, dumping, excavating, erecting a building, constructing or paving a parking area or roadway, installing drainage ditches or culverts, constructing groins or jetties, damming or changing the course of a stream, installing a dock or pier or dredging a boat slip in fresh or salt water.

Certain activities relating to agriculture, mosquito control and maintenance of (1) drainage and flooding systems of cranberry bogs and (2) most maintenance of existing utilities are exempt.

### Violations and Penalties

Whoever violates any provision of this section will be punished by a fine of not more than \$1,000 or by imprisonment for not more than six months or both.

In addition to stopping work in violation of the Act, the courts can order the landowner to correct the work which has been completed, even if it means putting the land back into its former condition.

### Inland Wetlands Act

The Inland Wetlands Act authorizes the Board of Environmental Management to adopt regulations restricting or prohibiting dredging, filling, removing or altering or polluting wetlands to protect public and private interests, wildlife, fisheries, water resources, floodplain areas and agriculture. The definition of "inland wetlands" includes the definition of "freshwater wetlands" established in chapter 131, Sec. 40, plus that portion of any bank which touches any inland water or freshwater wetland, and any freshwater wetland subject to flooding. The Commissioner of Environmental Management must establish encroachment lines based on the location and boundaries of wetlands which have been mapped and designated as inland wetlands. Once inland wetland or floodplain areas have been restricted, no obstruction or encroachment can be placed. The Commissioner of Environmental Management can amend an order of restriction subject to a public hearing. Also, any allowable use in a restricted wetland requires an order of condition under Chapter 131 Sec. 40:

the Wetland Protection Act. In addition, through the adoption of Orders of Restriction, specified activities or uses will be regulated, restricted, or prohibited. At present, fifteen towns within the Commonwealth of Massachusetts have wetlands which have been restricted under this program.

## MICHIGAN

TITLE: Goemaere-Anderson Wetland Protection Act of 1980  
Act No. 203, Public Acts of 1979, January 1980 Approval

LEAD AGENCY: Land Resources Commission

STATE CONTACT: Chuck Wolverton, Resource Specialist  
Division of Land Resources  
Department of Natural Resources  
Box 30028  
Lansing, Michigan 48909  
517/373-3328

### MICHIGAN INLAND WETLAND PROTECTION PROGRAM

#### Introduction

Michigan's Wetland Protection Act became effective on October 1, 1980. The law establishes a victory for the state which had unsuccessfully introduced wetlands legislation for the past 12 years. Previous to this legislation, wetlands were regulated through a variety of piecemeal legislation (Inland Lakes and Streams Act, Shorelands Protection and Management Act). Wetlands protection was limited to those wetlands no further than 1,000 feet inland. The new legislation will now provide protection for isolated wetlands and will cover all wetlands in the state. Once program funds are appropriated through the state legislature, the program will go into full operation.

Program development, rules and regulations and educational material are being formulated at the time of this report. In these efforts, the Commission is working with the U.S. Environmental Protection Agency in developing the Section 404 certification program.

#### Title, Purpose and Outputs Addressed

The Goemaere-Anderson Wetland Protection Act provides for the preservation, management, protection, and use of wetlands; requires permits to alter certain wetlands; provides for a plan of preservation, management, protection, and use of wetlands and provides for remedies and penalties.

#### Wetlands Definition

As defined in the Act, "wetlands" means:

"land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh. A wetland is any of the following:

- Contiguous to the Great Lakes or Lake St. Clair, an inland lake or pond, or a river or stream.

PRECEDING PAGE BLANK NOT FILMED

- Not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and more than 5 acres in size; except this subdivision shall not be of effect, except for the purpose of inventorying, in counties of less than 100,000 population until the Department certifies to the Commission of Natural Resources it has substantially completed its inventory of wetlands in that county.
- Not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and 5 acres or less in size if the Department determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the Department has so notified the owner".

#### Method of Establishing Standards

The Department of Natural Resources is authorized to promulgate the rules and regulations for the preservation, management, protection and use of wetlands. Those municipalities which choose to enact ordinances regulating wetlands may provide for more stringent definition and regulation of wetlands than the state program provides for. In regulating wetlands, the municipality and the Department of Natural Resources must develop an agreement with each other to exchange information which will assist the municipality in administering its ordinance. This agreement also authorizes the municipality to issue permits for proposed activities in wetlands. The process allows for Department review of proposed permit applications. If the municipality does not have an ordinance regulating wetlands, it is still given the opportunity to review and make recommendations on permit applications. The Department or municipality has the option of holding a public hearing on the proposed permit application in the county in which the activity is to take place.

#### Responsible Agency and Method of Administration

The law is administered by the Director of the Department of Natural Resources in cooperation with local municipalities. Any person proposing any of the following activities must first obtain a permit before conducting the activity:

- Deposit fill material in a wetland,
- Dredge, remove, or permit the removal of soil or minerals from a wetland,
- Construct, operate, or maintain any use or development in a wetland, and/or
- Drain surface water from a wetland.

The application must include the applicant's name and address, location of the wetland, a description of the wetland on which the use or development is to be made, a statement describing the proposed use or development, the wetland owner's name and address and an environmental assessment of the proposed use or development which must include:

- Effects upon wetlands benefits;
- Effects upon water quality, flow, and levels; and
- The wildlife, fish, and vegetation within a contiguous lake, river, or stream.

As inventories of wetlands are completed, they will be used by the Department as part of the criteria needed for issuing permits. Included in the inventories are maps, ground surveys and descriptions of wetlands. The inventories must be periodically updated. Aerial photographs and satellite telemetry data reproductions are required to be made available to the respective county

register of deeds for cost of reproduction as determined by the Department of Natural Resources. The Department has the authority to initiate a preliminary inventory of all wetlands in the state on a county- by-county basis. A public hearing can be conducted to allow for a comment period on the inventory.

### Applicability and Exemptions

The law applies to all private and non-federal wetlands in the state. The following uses are allowed in a wetland without a permit:

- Fishing, trapping or hunting
- Swimming or boating
- Hiking
- Grazing
- Farming, horticulture, silviculture, lumbering and ranching activities
- Maintenance or operation of serviceable structures
- Construction or maintenance of farm or stock ponds
- Maintenance, operation, or improvement of an agricultural drain for the production or harvesting of agricultural products
- Construction or maintenance of farm roads, forest roads, temporary roads for moving mining or forestry equipment. (These activities must be conducted in a manner to minimize adverse effects of wetlands)
- Drainage necessary for the production and harvesting of agricultural products on a commercial farm
- Maintenance, operation or construction of public works activities
- Construction of iron and copper mining tailings basins and water storage areas

### Violations and Penalties

If a person is found in violation of the Act the Department may issue an order requiring compliance, bring civil action and/or impose a civil fine not to exceed \$10,000 per day of violation. A person who violates this act is guilty of a misdemeanor and subject to a fine of not more than \$2,500. A person who willfully violates the Act is also guilty of a misdemeanor but subject to a fine of not less than \$2,500 nor more than \$25,000 or by imprisonment for not more than one year or both for each violation. A second violation is considered a felony punishable by a fine of not more than \$50,000 for each day of violation, or by imprisonment for not more than two years, or both.

In addition to the penalties provided, the court can order a person who violates this Act to restore the wetland which was affected by the violation, to as close to its original condition immediately before the violation. The restoration may include the removal of fill material deposited in the wetland or the replacement of soil, sand, or minerals.

## MINNESOTA

TITLE: Minnesota's Water Bank Program  
MINN. Stat. Chap. 105.392 et. seq.  
Minnesota's Public Waters and Wetlands Permit Program  
MINN. Stat. Chap. 105.37 - 105.391

LEAD AGENCY: Department of Natural Resources

STATE CONTACT: Dave Milles, Public Administrator  
Division of Waters  
Department of Natural Resources  
44 Lafayette Road  
St. Paul, Minnesota 55101  
612/296-0516

### MINNESOTA'S INLAND WETLANDS PROTECTION PROGRAM

#### Introduction

Minnesota has several programs relating to inland wetlands protection which are administered through the Department of Natural Resources (DNR), Division of Waters. The first program is the State Water Bank Program which is designed to help defray the costs of keeping wetland areas in their natural state by providing financial incentives to landowners. In order for an area to qualify for program money, the area must be classified as a "wetland" for the purpose of Minnesota Statutes, Chap. 105: drainage permits.

The second program is the Public Waters and Wetlands Permit Program which requires any person, agency or organization proposing to change the course, current or cross-section of Minnesota's public waters or wetlands to obtain a permit from the DNR. The underlying philosophy of this program is that the state not only has an interest in protecting the amount of water contained in lakes, marshes and streams, but also has an interest in protecting the container (i.e. lake, marsh or stream) which confines these waters. The Permit Program authorizes the DNR to inventory all the public waters and wetlands of each county and designate which of these constitute public waters and wetlands to be regulated and protected. This inventory will be completed by December 31, 1982.

The DNR has classified all wetlands, streams and lakes which have been identified as serving a beneficial public purpose. However, the counties have not responded enthusiastically to the prospect of working on inventories and potentially assuming the responsibility of regulating certain classes of public waters. This delay in the public waters inventory process has postponed both the advent of more certainty in the permit program and acquisition under the State Water Bank Program. The need for more specific definition of the areas regulated has been recognized, and may in fact require an even more specific program than the program described above.

## Title, Purpose and Outputs Addressed

Both the Water Bank Program and the Public Waters and Wetlands Permit Program are contained in Minnesota's Chapter 105: Water Resources; Conservation. Chapter 105 provides for the state control of (1) all public waters and wetlands and (2) any activity which will change the course, current or cross-section of public waters or wetlands.

## Wetlands Definition

As defined in Chapter 105, "wetlands", which are regulated and protected under Minnesota law, include and are limited to, all types 3, 4 and 5 wetlands that have not been designated as "public waters", which are 10 or more acres in size in unincorporated areas, or two and one-half or more acres in size in incorporated areas. The wetland types are defined in Circular 39, Wetlands of the United States, 1971 Edition, U.S. Department of Interior.

The following are some typical examples of "wetlands":

Type 3 - Inland Shallow Fresh Marsh - Soil is usually waterlogged during the growing season, often covered with as much as 6 inches or more of water. Vegetation includes grasses, bulrushes, cattails, arrowheads, smartweeds, and other emergent aquatic vegetation.

Type 4 - Inland Deep Fresh Marsh - Soil covered with 6 inches to 3 feet or more of water during growing season. Vegetation includes cattails, reeds, bulrushes, and wild rice. Open water areas may contain pondweeds, naiads, coontail, water milfoils, and other submergent aquatic vegetation.

Type 5 - Inland Open Fresh Water - Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, coontail, water milfoils and other submergent aquatic vegetation.

The boundary of wetlands, for regulatory purposes, is defined by the "ordinary high water mark" (OHW). The OHW is the elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape. Generally, it is the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

## Method of Establishing Standards

The DNR, Division of Waters is authorized to develop a general water resources program for the state. The program contemplates the conservation, allocation and development of all waters of the state and guides the Commissioner of the DNR in the issuance of permits. The Commissioner was authorized to survey, map, investigate and study the water resources and topography of the state to provide the information to formulate the program. He/she has administration over the use, allocation and control of public waters and wetlands, the establishment, maintenance and control of lake levels and water storage reservoirs, and the determination of the OHW level of any public water and wetlands.

The Commissioner, in cooperation with other state agencies, including the Minnesota Geologic Survey, established and maintained a statewide water information system to gather, process, and disseminate information on the availability, distribution, quality and use of state waters. At present, the data base only contains water use data. It is anticipated that all public waters and wetlands data will be acquired and digitized into the information system for use in the Public Waters and Wetlands Permit Program.

Public Waters Inventory and Classification. Once public waters and wetlands are designated as protected state waters, they cannot be drained for 10 years unless they are replaced by public waters or wetlands of equal or greater value. Wetlands which are eligible for the State Water Bank Program can be drained without a permit and without replacement if the Commission does not elect, within 60 days of receipt of a permit application, to either (1) place the wetlands in the State Water Bank Program; (2) acquire it; or (3) indemnify the landowner through any other appropriate means.

#### The water bank Program

The Water Bank Program provides for the protection and preservation of state wetlands to:

- Conserve surface waters;
- Preserve wildlife habitat;
- Reduce runoff;
- Provide for floodwater retention;
- Reduce stream sedimentation;
- Contribute to improved subsurface moisture;
- Enhance the natural beauty of the landscape; and
- Promote comprehensive and total water management planning.

The program authorizes the DNR to promulgate rules and regulations to protect designated wetlands and supplement the Federal Water Bank Program. The DNR must accomplish this task by entering into agreements with landowners for a period of 10 years for the conservation of wetlands.

If a wetland qualifies for the program, the landowner must be able to show that drainage of the area would not violate any property agreements or adversely affect the rights of other landowners (if any), that outlet rights can be obtained, a statement demonstrating why proposed drainage would be profitable and a statement by a Professional Soil Classifier that the area would be high quality cropland. From this information a determination of eligibility is then made.

If the area is eligible, the Department of Natural Resources is then obligated to offer the qualifying landowner, within 60 days after applying for a permit to drain, the following choices of compensation:

1. An offer to place the area in the State Water Bank Program;
2. An offer to purchase the area;
3. An offer to acquire an easement on the area; and/or
4. An offer to lease the area.



The Department is also obligated to inform the landowner of the following:

1. If the area appears to be eligible for the Federal Water Bank Program;
2. That the landowner may suggest other compensation methods, along with the proposed terms and conditions;
3. That adjacent property (up to one acre per wetland acre) may be included in the terms of the agreement; and
4. That the landowner has the choice of any one of the compensation offers or any other method of indemnification that the Department will agree to.

If within 60 days of receipt of a complete permit application the DNR does not offer the landowner the compensation choices as outlined above, the landowner is legally entitled to drain the wetland. If the area is not eligible for the State Water Bank Program, the DNR must also inform the landowner of this and provide notice that he has the right to demand a hearing.

Terms for water bank or lease agreements generally restrict the use of the wetlands from all agricultural purposes. The adjacent lands that may be included in an agreement can be managed differently and the DNR may negotiate and outline a conservation plan for these lands.

#### The Public Waters and Wetlands Permit Program

Minnesota's Public Waters and Wetlands Permit Program prohibits any work done below the Ordinary High Water Mark of public waters and wetlands without first obtaining a DNR Permit. Typical examples of projects requiring a permit include: draining, filling, dredging, channelizing, construction of dams, harbors or permanent off-shore structures, placement of bridges and culverts, and installation of water and sewer crossings.

Some projects will not require permits from the DNR if certain conditions are met. Local units of government and other agencies, however, may still require permits for these projects. Projects within the beds of public waters and wetlands not listed as exempt require permits from the DNR. Projects that are determined to be detrimental to public values (including but not limited to fish and wildlife habitat, navigation, water supply and stormwater retention) may be modified or rejected by the DNR.

These projects will not require permits if constructed within the following restrictions:

- Beach Sand Blanket
  - Clean, inorganic sand and/or gravel free of pollutants and nutrients
  - No more than: 6" thick, 50' wide along shore, 10' waterward of OHW (approximately 9.3 cubic yards)
  - Site is not a posted fish spawning area
- Riprap
  - Natural rock only - No more than 5' waterward of OHW
  - Conforms to natural alignment of shore

- Minimum finished slope no steeper than 3:1
- Permits required to riprap Lake Superior or any designated trout stream
- Boat Launching Ramp
  - Site can support ramp without pilings, dredging, or other special site preparations
  - Constructed only of gravel, natural rock, concrete, steel-matting, or other durable inorganic material
  - No more than: 6" thick, 12' wide along shore, 10' waterward of OHW or into water depth of 4', whichever is less
- Seasonal Dock
  - Removable from lake or stream bed on a seasonal basis
  - Components removable by non-mechanical means
  - Must not obstruct navigation and/or create a water safety hazard
- Permanent Dock
  - Site prohibits use of seasonal dock
  - Constructed or reconstructed on wood pilings
  - No more than 50' waterward of OHW or to 4' water depth, whichever is less
- Low Water Ford Crossing
  - No special site preparation necessary
  - Normal summer flow does not exceed 2'
  - Normal low flow is not restricted or reduced
  - Crossing conforms to natural stream channel
  - Original stream bank no higher than 4'
  - Constructed only of gravel, natural rock, concrete, steel-matting or other durable, inorganic material less than 1' thick
  - Graded finished slope no steeper than 5:1
  - Graded banks must be seeded or mulched
  - Not allowed in officially designated trout stream or federal wild, scenic or recreational river
- Temporary Bridges
  - Stream bank can support bridge without pilings, foundations, culverts, excavation, or other special site preparations
  - Nothing placed in the bed of the stream
  - Capable of removal for maintenance and flood damage prevention
  - Bridge firmly anchored at one end
  - Can swing away during flooding
  - Minimum 3' clearance between lowest portion of bridge and normal summer stream flow
- Installation of Agriculture Drain Tile Outlets
  - The outlet involved no construction of open ditch
  - Bank is restored to natural slope
  - Natural rock riprap is used wherever the tile outlet may cause excessive erosion
  - Installation does not require channelization, dredging or filling

- Maintenance of Storm Sewer, Agricultural Drain Tile and Ditch Outlets
  - Outlet must have been maintained and functioning within the last five years
  - Maintenance work does not alter the original course, current or cross-section of the public water or wetland

#### Violations and Penalties

Any work exceeding the limits listed above and/or any other work in public waters or wetlands without a permit is a violation constituting a misdemeanor and is subject to a fine of up to \$500 and/or 90 days in jail.

## NEW HAMPSHIRE

TITLE: Fill and Dredge in Wetlands; Rules and Regulations  
N.H. RSA 483-A

LEAD AGENCY: Wetlands Board

STATE CONTACT: George McGee, Chairman  
Wetlands Board  
37 Pleasant Street  
Concord, New Hampshire 03301  
603/271-2147

### INLAND WETLANDS PROTECTION IN NEW HAMPSHIRE

#### Introduction

The New Hampshire Wetlands Board was established to issue permits regulating all uredge and fill activities in tidally influenced areas, and all surface waters flowing and standing which include inland wetlands. All persons proposing to conduct such activities must file a written notice of intent to the Wetlands Board before a permit to conduct the activity is granted.

#### Wetlands Definition

"Freshwater wetlands" as defined in the rules and regulations for the Wetlands board means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. This includes bogs, marshes and swamps.

#### Method of Administration

The law authorizes the Wetlands Board to develop rules and regulations establishing criteria for approval and disapproval of permit applications for activities in prime wetlands. No permit will be granted if the activity significantly impairs any of the following values of wetlands:

- Aquatic and wildlife habitat
- Sources of nutrients for aquatic life
- Vegetation
- Recreation and aesthetic opportunities
- Groundwater supply
- Stream channels
- Flood water retention

Local governments have the option to designate, map and document prime wetlands lying within or partially within their boundaries. Factors to be considered for prime wetland designation are:

- Size
- Unspoiled character
- Fragile condition
- Other relevant factors

### Rules and Regulations

Rules and regulations for the Wetlands Board establish criteria to determine the impact a project has upon a wetland. The regulations differentiate between major impact projects and minimum impact projects and regulate the following activities:

- Dredge
- Fill
- Construction
- Seasonal docks
- Replacement, repair and replenishment
- Removal
- Crossings
- Dug ponds

The regulations also establish the following criteria to determine approval of permit applications:

- Type of freshwater wetland (bog, marsh or swamp) (Bogs are of most interest in preservation efforts, with swamps of least concern.)
- Location of freshwater wetland
- Identification of salt water marshes due to their productivity and past encroachments
- Impact on plant, fish and wildlife habitat
- Impact of proposed project
- Interference with aesthetic interests
- Impact upon abutting owners
- Size
- Interest and benefits to general public
- Impact on water quantity and quality

### Violations and Penalties

Any person found in violation of this Act is guilty of a misdemeanor. Non-citizens of the United States will be guilty of a felony. Continuing violations will be restrained.

Failure, refusal or neglect to obey a lawful order may be fined a penalty not to exceed \$5,000. The proceeds may be used by the Wetlands Board for the restoration of the area affected by the violation or for research and investigation relative to wetlands.

## NEW YORK

TITLE: Freshwater Wetlands Act  
N.Y. Envir. Conserv. Law art. 24

LEAD AGENCY: Local units of government, Department of Environmental  
Conservation, Adirondack Park Agency

STATE CONTACT: Louis Condra, Director  
Division of Regulatory Affairs  
Department of Environmental Conservation  
50 Wolf Road  
Albany, New York 12233  
518/457-7418

### NEW YORK'S FRESHWATER WETLAND PROTECTION PROGRAM

#### Introduction

The Freshwater Wetland Act, passed by the Legislature and signed by the Governor in 1975, seeks

"to preserve, protect and conserve freshwater wetlands and the benefits derived therefrom.....consistent with the general welfare and the beneficial economic, social and agricultural development of the state."

This Act is one of the most important tools the people of the state have for guiding use of a major natural resource.

In June 1980, the Department of Environmental Conservation (DEC) adopted the regulations which will govern implementation of the Freshwater Wetlands Act. The new regulations will apply to those areas of the state where final freshwater wetlands maps have been filed. Until a map is filed in a given area (in general, filing is being done county-by-county), implementation will continue to be governed by interim regulations.

The new regulations are in two parts. Part 663 deals with the review and processing by the DEC of applications for permits to conduct activities on wetlands. A local government may choose to be the permit issuing agent once the appropriate maps are filed by the DEC and the local government has adopted a local ordinance which has received state approval. The DEC will carry out that function where the local government does not. Part 664 addresses the classification and mapping of wetlands, both of which remain the DEC's responsibility under the Act, even where a local government is the regulating authority.

Both parts of the regulations were subjected to extensive scrutiny. The final regulations reflect careful consideration of comment made at public hearings or provided subsequently to the DEC by the public.

The drafters of the regulations faced an unusually difficult task. The biological, hydrological and environmental characteristics of freshwater wetlands vary widely, and they occur under many different geographical, geological, social and economic circumstances across the state. There are wetlands whose preservation is absolutely critical, and also wetlands whose benefits, as far as are known at this time, are quite limited. The regulations had to provide an underlying framework of uniformity while allowing the breadth and flexibility needed to take into account the range of conditions in the state. Work on the regulations started with an examination of the functions and benefits of wetlands.

#### Title, Purpose and Outputs Addressed

The Freshwater Wetlands Act provides for the preservation, protection and conservation of freshwater wetlands and the benefits derived from these wetlands. The Act is designed to prevent the despoilation and destruction of freshwater wetlands and to regulate use and development of these wetlands to secure the natural benefits of freshwater wetlands, consistent with the general welfare and beneficial economic, social and agricultural development of the state. The benefits derived from wetlands that are determined to be protected in the Act are:

- Flood and stormwater control
- Wildlife habitat
- Subsurface water resources
- Valuable watersheds
- Groundwater supplies
- Recreation
- Pollution treatment
- Sediment control
- Education and scientific research
- Open space and aesthetic appreciation
- Sources of nutrients in freshwater food cycles, and nursery grounds and sanctuaries for freshwater fish

#### Wetlands Definitions

"Freshwater wetlands" means lands and waters of the state as shown on the freshwater wetlands maps which contain any or all of the following:

(a) Lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation of the following types:

(1) Wetland trees, which depend upon seasonal or permanent flooding or sufficiently waterlogged soils to give them a competitive advantage over other trees; including, among others, red maple, willows, black spruce, swamp white oak, red ash, black ash, silver maple, American elm, and larch;

(2) Wetland shrubs, which depend upon seasonal or permanent flooding or sufficiently waterlogged soils to give them a competitive advantage over other shrubs; including, among others, alder, button-bush, bog rosemary, dogwoods, and leatherleaf;

- (3) Emergent vegetation, including, among others, cattails, pickerelweed, bulrushes, arrow arum, arrowheads, reed, wild rice, bur-reeds, purple loosestrife, swamp loosestrife, and water plantain;
- (4) Rooted, floating-leaved vegetation; including, among others, water-lily, water shield, and spatterdock;
- (5) Free-floating vegetation; including, among others, duckweed, big duckweed, and watermeal;
- (6) Wet meadow vegetation, which depends upon seasonal or permanent flooding or sufficiently waterlogged soils to give it a competitive advantage over other open land vegetation; including, among others, sedges, rushes, cattails, rice cutgrass, reed canary grass, swamp loosestrife, and spike-rush;
- (7) Bog mat vegetation; including, among others, sphagnum mosses, bog rosemary, leatherleaf, pitcher plant, and cranberries;
- (8) Submergent vegetation; including, among others, pondweeds, naiads, bladderworts, wild celery, coontail, water milfoils, musk-grass, stonewort, water weeds, and water smartweed;
- (b) Lands and submerged lands containing remnants of any vegetation that are not aquatic or semi-aquatic that have died because of wet conditions over a sufficiently long period, provided that such wet conditions do not exceed a maximum seasonal water depth of six feet and provided further that such conditions can be expected to persist indefinitely, barring human intervention;
- (c) Lands and waters substantially enclosed by aquatic or semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b), the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation; and
- (d) The waters overlying the areas set forth in (a) and (b) and the lands underlying (c).

#### Method of Administration and Establishing Standards

The law is administered by the DEC. After issuance of the state's official Freshwater Wetlands Maps, persons desiring to conduct regulated activities on freshwater wetlands or their adjacent areas must first obtain a permit where close examination is required, or a letter of permission from the DEC or the local government, whichever is applicable. No permit will be granted unless the proposed activity is in conformance with land use regulations established by the local government or DEC for the wetlands under its jurisdiction.

Part 663 of the regulations addresses the different kinds of activities that may affect freshwater wetlands. Some activities -- e.g., most agricultural pursuits -- are not regulated because they are exempted in the Freshwater Wetlands Act itself. Others, such as ordinary maintenance activities, have been exempted by the DEC because they are expected to have little or no effect on wetlands.

The impacts of some other activities will usually be slight; but because under some circumstances the impact could be significant, an abbreviated procedure (termed "letter of permission") will be used to review an application to undertake them. It may be necessary for the DEC to require the more complete permit procedure if the specific proposed activity could have a substantial effect on a particular freshwater wetland, even if most activities of the same kind in most other wetlands would not.



The full permit procedure is required for those kinds of activities which are likely to have a substantial effect on wetlands. Part 663 contains a list of activities, indicating which are exempt, which most often will require a letter of permission, and which will require a permit.

The classification, with the standards tied to it, and consideration of the likely effect of different kinds of activities on freshwater wetlands, provide the basis for the DEC's regulation. The classification evaluates the wetland resource, while the assignment of activities to "exempt," letters of "permission" and "permit" categories provides means for evaluating the impact of activities. Together they are expected to give the needed uniform, yet flexible, framework.

The severity of impact on a Freshwater Wetland (FWW), determines whether an activity is exempt or requires a letter of permission or a permit. A general description of regulated activities includes the following:

- Draining, filling, grading, clear-cutting and dredging
- Installation and construction of dams, docks and bulkheads
- Utility installation
- Application of pollution and pesticides
- Construction
- Minor maintenance, repair or restoration not listed as exempt
- Repetitive use of all terrain and recreational vehicles

A more detailed description of regulated activities and the severity of regulations is provided for in Part 663: Freshwater Wetlands Permit Requirements Regulations.

The Adirondack Park Agency has the authority to promulgate regulations and land use standards for permit issuance for wetlands within the Park's boundary.

#### Freshwater Wetlands Study

The Commissioner of the DEC was required to conduct a study to identify, map and determine the characteristics of individual freshwater wetlands within the state which have an area of at least 12.4 acres or more or, if less than 12.4 acres (a) have unusual local importance for one or more of the specific wetland benefits or (b) are located within the Adirondack State Park.

This study was required to include the freshwater wetlands inventory conducted by the DEC along with other necessary data. All the information was assembled and integrated into maps of freshwater wetlands in the state. The maps, a part of the statewide environmental plan, are supposed to set forth accurate boundaries of the wetlands. Hearings are held in all areas where maps are completed. Final maps are due not earlier than 60 days after the hearing.

Because of the importance of wetlands and their vulnerability, the DEC's Division of Fish and Wildlife in the early 70s sought information on wetlands in New York State (NYS), their characteristics and distribution. Until this time, there was no comprehensive, statewide survey designed to seek out, identify and collect data on all wetlands of the state. The wetlands inventory began in 1973. The methods of data collection were developed by the Resource Information Lab at Cornell University.

Designed primarily for fish and wildlife management planning, with emphasis on data of biological significance, the inventory was also intended for use in environmental analysis. Not designed for regulatory or other legal purposes, nor to collect detailed information on hydrology, geologic origins, or water chemistry, one intention of the inventory was to form a uniform, statewide data base to which future wetlands data could be compared to determine what changes were taking place in the wetlands resources of the state.

The identification and measurement of every wetland in the state was a tremendous undertaking involving air photo interpretation, field checks, map making, and wetlands data gathering. The main source of information was a series of black and white aerial photographs taken in 1968. The inventory defined, mapped and measured wetlands according to the kind of vegetative cover growing on the area and these cover types were further defined by their structure, such as flooded conifers or emergent vegetation, rather than by individual plant species.

The project, requiring approximately 60 man years and \$500,000, ultimately resulted in 968 overlays of USGS 7 1/2 topographic quadrangles depicting freshwater wetlands larger than .5 acre. All data for all wetlands 2.5 hectares and larger, including area, perimeter, water and land contacts, special characteristics and human influences, were entered into a computer system. Thus, it is possible to retrieve information about any individual wetland, to select wetlands by village, town or county, by type of vegetation, by size, or by any other combination of characteristics.

A preliminary look at the inventory data has revealed some facts of special interest to fish and wildlife biologists in planning for species management, for land acquisition, and for habitat protection.

- There are some 125,000 wetlands in NYS. The most common type of wetland vegetation is flooded deciduous trees; wetland flooded shrubs the second most common; and flooded conifers a close third.
- Beavers are important in the dynamics of many wetlands and may be responsible for creating and maintaining wetlands as the only openings in vast expanses of forest. The inventory shows that beaver had been living in over 4,000 wetlands.
- Bogs are favored nesting sites of Nashville warblers and an important source of peat moss. Bogs are also of botanical interest for their unique and unusual plants, and pollen grains in bog sediment provide historical data of the climate and plants of the area.
- The following human influence activities that are present within 1,000 feet or within 2-5 hectares of the boundary of each wetland are: agriculture and forestry, residences, waste disposal, public lands and institutions, recreation, industry and commerce, transportation and utilities and various engineering features. Ninety-three percent of state wetlands were near agricultural uses (i.e. 60 percent farm field crops, 33 percent near pasture). Land was drained in approximately 25 percent of the wetlands and streams in or near about 15 percent of the wetlands had been channelized. Draining and stream channelization were often associated with various urban development activities. Therefore, man's use of the land surrounding a wetland may determine the value of that wetland as fish and wildlife habitat.

By providing information on vegetation cover type and a "shape index" or measure of edge-effect for each wetland, the inventory will play a role in plans for the restoration and management of state-owned wetlands. The inventory will also prove to be invaluable in assessing wetlands for acquisition.

While the inventory was designed for meeting fish and wildlife management needs, its potential for other uses did not escape notice. When the Freshwater Wetlands Act was passed in 1975, requiring the DEC to produce a set of maps for each county in the state showing the location and boundaries of each wetland 12.4 acres or larger, the DEC decided to use U.S. Fish and Wildlife Service wetland overlays as its primary source for mapping. This inventory provided the best available information throughout the state. Thus, although designed for different purposes, the inventory overlays are being used along with other sources such as field checks and the wetland mapping shown on US Geological Survey (USGS) maps to produce the official wetlands maps for regulatory purposes. Data from the inventory are also being used in the classification of wetlands as required under the Act.

The wetlands inventory will be of continuing value to a variety of people. For instance, a town planning board might like to know how many wetlands exist within its boundaries, and where they are located. A simple computer retrieval of wetlands in that town could give the wetland numbers, areas, the USGS quadrangle on which each wetland can be found and any other data which might be needed, such as whether a wetland is near a road, a landfill, or a sewage treatment plant. There is a tremendous mass of wetlands data with an exciting potential for analysis and research, including the distribution and characteristics of wetlands, their differences from one part of the state to another, the factors that are most constant or most variable, and a host of other facts. For example, pike depend upon certain types of wetlands associated with fairly large bodies of open water as spawning and nursery grounds. The inventory can provide this wetlands and open waters information, too. Researchers in Minnesota have discovered that cattails, more productive of biomass than corn, may be an economically feasible fuel supply. The inventory can help assess New York's supply of cattail marshes.

A technical manual describing the inventory methods in detail is nearly complete. An analytical report concerned with the data and its application is planned.

#### Map and Classification Regulations

The Department of Environmental Conservation alone is authorized to map and classify wetlands, regardless of which agency is implementing the Act in a particular locality. The Adirondack Park Agency is responsible for classifying wetlands in the Adirondack Park.

Where the DEC is the regulating authority, a land use classification system takes effect in the DEC's freshwater wetland permit requirements regulations. Standards for issuance of permits are provided for each of the four wetland classes.

The classification system establishes four separate classes that rank wetlands according to their ability to perform wetland functions and provide wetland benefits.

Not all wetlands supply equal benefits. The degree to which wetlands supply benefits depends upon many factors, including: their vegetative cover, their ecological association, their special features, their hydrological and pollution control features, and their distribution and location, and these may vary considerably from wetland to wetland.

Recognizing that all wetland benefits do not occur equally in all wetlands, 40 specific characteristics associated with each wetland benefit were developed to provide an objective basis for measuring freshwater wetland benefits. For a more detailed description of the 40 characteristics, refer to Appendix C-1, "Classification System for Freshwater Wetlands in New York State." Refer to Appendix C-2 for an "Explanation of the Classification Characteristics for Freshwater Wetlands in New York State."

Some examples of these characteristics are location in an urbanized area, support of an endangered species, connection to an aquifer, or supports fish or wildlife in unusual abundance or diversity, is adjacent to a public water supply, or is tributary to a body of water which could subject a developed area to flooding. The 40 characteristics were then used to assign wetlands into four classes.

Class I wetlands have characteristics associated with the greatest benefits, while Class IV wetlands provide the least benefits. Location within an urbanized area, for instance, assigns a freshwater wetland to Class II, as does connection with an aquifer under the appropriate geological conditions. If a wetland is habitat for an endangered species, that wetland belongs in Class I.

This classification system takes practical effect in setting standards for permit issuance. The standards are graded according to the classification of the wetland to be affected. It will be difficult to get a permit to conduct an activity that will harm a Class I wetland while it will be relatively easy to get a permit to conduct such an activity in a Class IV wetland. In many cases, of course, it may be possible to modify the activity so that the applicant can accomplish his/her purpose without harming the wetland.

The DEC will be classifying all the freshwater wetlands in the state that are subject to regulation under the Act. This is no small job because it involves the evaluation of many thousands of wetlands. A system for classification by computer using these data has already been tested. The computer classification will be supplemented by the experience and knowledge of the DEC's biologists and environmental analysts and also by contributions from outside the DEC.

#### Freshwater Wetlands Preservation Program

Upon completion of the Freshwater wetlands maps, the DEC, in conference with local governments, is responsible for developing a statewide freshwater wetland protection program providing for the preservation and maintenance of freshwater wetlands. After completion of the freshwater wetlands map, the DEC must classify wetlands according to their appropriate land use, determining what land uses are compatible with the wetlands through preparation of minimum land use regulations. A framework for making this determination is contained in the wetland classification system and Part 663 of the Regulations. Once

these regulations are completed and a hearing is conducted, local governments have six months to submit proposed regulations, consistent with the state's regulations, governing freshwater wetlands within its boundaries. Prior to the adoption of the final freshwater wetlands maps and implementation of the law, an interim program and set of regulations was in force providing a permit procedure for freshwater wetlands.

### Local Implementation

Local governments were able to adopt, amend and, upon the filing of the appropriate freshwater wetlands maps, implement a freshwater wetlands protection law or ordinance. The local law must be as protective of freshwater wetlands and as effective as the State law. If the local government did not adopt a local ordinance, the county government assumed jurisdiction by adopting an ordinance. In turn, the DEC assumed the authority to implement the wetland protection law in the event the county government failed to do so. Should a local or county government which has assumed the authority to implement a local ordinance improperly administer the program, the authority to implement the program will revert to the DEC. The local or county government may recover their authority at any time by adopting and implementing a wetland protection ordinance consistent with the state program, and by notifying the county or DEC of the adoption. The DEC has the authority to exempt from local implementation those freshwater wetlands which, due to their size or special characteristics of unique environmental value or due to common characteristics, are appropriate for statewide jurisdiction. Class I wetlands are identified in this category, because the effects of Class I wetlands will be felt far beyond the borders of the locality in which it was found. Freshwater wetlands that are not designated on the wetlands maps because they are less than 12.4 acres in size and are not of unusual local importance are reserved for local jurisdiction. Wetlands located within the boundaries of the New York State Adirondack Park are assigned to the jurisdiction of the Park Agency unless the Agency relinquishes its authority to the local government, where some or all of the wetlands are located and a wetlands protection ordinance is already being implemented.

### Applicability and Exemptions

The law applies to all non-federal public and private freshwater wetlands and their adjacent areas. The following are exempt from regulation by law or have been determined to have little or no effect on the functions of wetlands: existing uses and activities; scenic, historic; wildlife and scientific preserves; non-motorized forms of outdoor recreation; fishing, shellfishing, hunting or trapping; educational and scientific research activities; establishing walking trails; recreational mooring; gathering firewood; agricultural activities; minor maintenance, repair or restoration activities; and occasional use of motor vehicles. These activities do not require a permit or letter of permission.

### Violations and Penalties

Administrative Sanctions. Any person who violates any provision of this law is liable for a civil penalty not to exceed \$3,000 for each violation. The person may also be required to restore the affected wetland to its prior condition.

Criminal Sanctions. Any person who violates any provision of this law is guilty of a violation punishable by a fine of no greater than \$1,000, for the first offense. For the second offense, the person is guilty of a misdemeanor punishable by a fine not to exceed \$2,000 or a prison term not to exceed 6 months, or both, for each offense. Restoration of the wetland may substitute for the punishment.

## RHODE ISLAND

TITLE: FRESH WATER WETLANDS ACT  
R.I. Gen. Laws Sec. 2-1-18 through 2-1-25

LEAD AGENCY: Department of Environmental Management

STATE CONTACT: Peter Janaros, Chief  
Division of Land Resources  
Department of Environmental Management  
75 Davis Street  
Providence, Rhode Island 02908  
401/277-2797

### RHODE ISLAND'S FRESH WATER WETLANDS PROGRAM

#### Introduction

In July 1971, Rhode Island passed the Fresh Water Wetlands Act. It provided for the protection of fresh water wetlands by prohibiting their destruction or disturbance by individuals, companies or state and local governments without permission from the Department of Natural Resources. The Act has significantly been amended and updated to its present form. Revised rules and regulations governing the enforcement of the Act were in final draft form in November 1980.

Significant administrative changes have also accompanied the development of Rhode Island's Fresh Water Wetlands Program. When the Law was first enacted in 1971, it was administered by the Department of Natural Resources. Under the Department's administration, the scope of the Fresh Water Wetlands Act was expanded. In 1974, the area where disturbance or destruction activities were prohibited was expanded to include buffer zones around fresh water wetlands. In 1976, enforcement authority with the Department of Natural Resources was strengthened. In 1977, the Department of Natural Resources assumed new responsibilities. Through this effort the Department of Natural Resources was reorganized to become the Department of Environmental Management (DEM). At this time the Division of Land Resources of the DEM assumed the responsibility of administering the Fresh Water Wetlands Program.

#### Title, Purpose and Outputs Addressed

The Fresh Water Wetlands Act provides for the preservation of the purity and integrity of the swamps, marshes and other fresh water wetlands of the state. The Act intends to restrict and regulate the uses of fresh water wetlands and recognizes the following benefits derived from these wetlands:

- Floodwater prevention
- Groundwater recharge
- Wildlife habitat
- Reducing the threats from draining, filling, excavating and other disturbances
- Sediment damage prevention
- Open space and recreation

### Wetland Definition

The term "fresh water wetlands," as used in this law, includes but is not limited to, marshes; swamps; bogs; rivers; river and stream flood plains and banks; areas subject to flooding or storm flowage; areas where groundwater, flowing or standing surface water or ice provide a significant part of the supporting substrate for a plant community for a significant part of the year; emergent and submergent plant communities in water bodies; and that portion of any bank which touches any inland waters.

### Method of Administration

The Law is administered by the Fresh Water Wetlands Section of the Division of Land Resources in the Department of Environmental Management. The Fresh Water Wetlands Section (FWWS) is authorized to receive, analyze, investigate and process complaints, requests for preliminary determination, and applications for approval to alter fresh water wetlands.

Any person proposing to conduct an alteration activity within a fresh water wetland or within any of the buffer zones established around fresh water wetlands, must go through the following steps before a permit to conduct the activity is issued.

- Step 1. Request for Applicability Determination - Prior to filing for an application for approval to conduct any activity in a fresh water wetland or adjacent buffer zones, the applicant may request an applicability determination as to whether or not the Wetland Act applies. If the FWWS determines that the proposed activity will insignificantly alter the wetland, or that adequate controls will be provided, the application will be approved. Proposals which will result in significant alteration of fresh water wetlands are subject to the following formal application procedure (Step 2.).
- Step 2. Applications for Approval to Alter a Fresh Water Wetland - Approval or disapproval to alter a fresh water wetland depends on whether or not the proposed activity will significantly alter a fresh water wetland. The following factors are used to make this determination:
  - Reduction of the volume of a floodplain;
  - Reduction of the wetland's ability to moderate floodwater damage;
  - Reduction of the wetland's ability to recharge groundwater aquifers, especially those which are existing or potential groundwater supplies;
  - Reduction in water usage through sedimentation (as defined in Rhode Island Water Quality Regulations for Water Pollution Control, RI DEM, 1979);



- Reduction in a wetland's ability to remove pollutants from surface water;
- Degradation of the natural character of unique wetlands;
- Reduction in wetland value;
- Effects on floodplain, drainage, soil stability, water quality, wildlife habitat and recreation; and
- Extent of damage to resources vital to the balance of the wetland environment.

The formal application process requires public notice for 45 days. During this time, the local municipality where the proposed activity is located may review the application. If the municipality approves the application, the Department of Environmental Management can still deny approval of the activity. If the municipality denies the application, the DEM must also deny the application's approval.

The rules and regulations developed and adopted by the DEM generally prohibit the discharge of waste, dredging, filling, draining, construction activities, alteration activities or any other activities that significantly alter the biological or hydrological character of wetlands. The DEM's jurisdiction includes the following buffer zones adjacent to fresh water wetlands:

- Within 50 feet of any fresh water wetland;
- Within 100 feet for rivers under 10 feet wide;
- Within 200 feet for rivers over 10 feet wide; and
- Within the 100 year floodplain.

#### Applicability and Exemptions

The law applies to all public and private fresh water wetlands. Activities which are not considered to significantly alter a fresh water wetland include:

- Selective tree cutting without destruction to soil and existing topography;
- Grazing and continued agricultural practices (i.e. planting, cultivating and existing fields);
- Brush and footpath cutting which do not physically change topography;
- Maintenance to existing structures where no physical changes to structure are proposed;
- Manual removal of debris or accumulated sediment from stream channels where no changes in stream cross section or profile is anticipated.

#### Violations and Penalties

In the event of a violation, the Director of the Department of Environmental Management can issue a notice of violation which will be recorded on a land evidence record within the municipality. At this time a preconference hearing may be held to discuss wetland restoration efforts. If the violator is uncooperative, the DEM can seek recourse through the State Supreme Court. If compliance is not achieved, the violator can be ordered to completely restore the wetland or the DEM can order the work done by a chosen agent. In the latter case, the violator will be held liable for the cost of restoration and subject to a fine not to exceed \$1,000 for each violation.

Those persons who commence activities without the Director's approval may also be ordered to cease work and restore the wetland to its original state.

#### Effectiveness of Law

Due to the strength and effectiveness of Rhode Island's Fresh Water Wetlands Law, Rhode Island is one of several states being considered for Section 404 certification of the Federal Clean Water Act. Under this section, states are required to regulate all discharges of dredge and fill material into the waters of the U.S., including wetlands. Several reasons Rhode Island's Law is recognized as being highly effective include:

- Statutory strength of Law;
- Centralized authority and expertise in Department of Environmental Management (the Rhode Island Law is administered through one agency);
- Strong enforcement authority;
- Cooperation with building officials - no building permit can be issued until it clears the Fresh Water Wetlands Section;
- Good cooperation from the Attorney General's office; and
- Good support from the Governor and his staff.

PART IV  
APPENDICES

APPENDIX A  
STATE LANDSAT APPLICATIONS AND NATURAL  
RESOURCE INFORMATION SYSTEMS

PRECEDING PAGE BLANK NOT FILMED

## The Michigan Resource Inventory Act

The first step to initiate a consistent and comprehensive inventory of Michigan's land resources to assist in making decisions which affect their future viability was taken when the Michigan Legislature overwhelmingly passed and appropriated funds to support the Michigan Resource Inventory Act (PA 204 of 1979).

The Act requires the completion of land resource and current land use/cover inventories which have to be periodically updated and provided to local governments to enhance their planning and resource management programs. To input policy and technical decisions, the Act establishes a 20-member Inventory Advisory Committee (IAC). The IAC has since then agreed on the classification system of existing land uses and has created five subcommittees [identifying with] the following land resources:

- Agriculture
- Forestry
- Minerals
- Special and Unique Environments
- Urban Development

The IAC will be meeting in December 1980 to:

- Report on the land classification system;
- Report on the methodology of data collection for resource inventory data; and
- Establish priorities for technical assistance.

In 1979, Michigan enacted the Goemaere-Anderson Wetland Protection Act which authorized the Land Resources Division (LRD) of the Michigan Department of Natural Resources to inventory all wetlands in the state on a county-by-county basis. The classification system established under the Wetland Protection Act was based upon different criteria than the classification system established under the Resource Inventory Act. Recent efforts have succeeded in making this classification system and therefore, inventory information interchangeable. Now that both programs are dealing with the same data base, the PA 204 Program will be providing assistance in the LRD's data collection efforts for the wetlands inventory requirement. Wetland inventories have been completed for 50 percent of the state.

The long-range implications of the Michigan Resource Inventory Act could be substantial. Through IAC's preparation of consistent land resource identification criteria and classification systems, costs will be reduced because information is interchangeable. But more importantly, knowledge and communication between all land resource management agencies will be improved because they will be dealing with the same information base. Finally, the technical assistance program established by the Act will be of great help to local governments, especially those without planning staffs or with limited financial resources.

## The Minnesota Land Management Information System (MLMIS)

The Minnesota Water Pollution Control Agency is taking advantage of enhanced capabilities of a statewide information system to analyze and classify lake quality using Landsat and other data.

148 J 2 ~~148 J 2~~ ~~148 J 2~~

The Minnesota Land Management Information System (MLMIS) began in the mid 1960's when funding was earmarked for accelerating natural resource projects through the Minnesota Outdoor Recreation Commission (since renamed the Legislative Commission on Minnesota Resources (LCMR)). It was developed as a joint research project between the State Planning Agency and the Center for Urban and Regional Affairs of the University of Minnesota. Financial support for developing the project has come from a variety of sources with major contributors being the state legislature and state agencies.

In July 1977, the MLMIS staff and computer terminals were moved to the State Planning Agency as the nucleus of the Land Management Information Center (LMIC). Operational funding for the professional staff is provided within the legislative appropriation to the State Planning Agency. A separate revolving account is used for billing clients who request special services from the Information Center. LMIC is a division of the State Planning Agency with a service bureau theme. It is not intended to serve the State Planning Agency exclusively, or even primarily. It is available on an equal basis to all governmental agencies and private organizations operating in the state.

In 1979, MLMIS received an LCMR appropriation to purchase its own mini-computer system. The Land Management Information Center has developed its own data handling software package called Environmental Planning Programming Language (EPPL). This software is designed to enter, analyze and display information using grid-cells of any size. With the new computer system, polygon form data entry is now possible.

The 40-acre parcel is the predominant geographic entity in the system for which data are collected statewide; it is based on the U.S. Public Land Survey. The computer files contain information for each of the 1.4 million 40-acre parcels in the state. The files include data on cultural features of parcels (such as ownership or road access), locational characteristics (township and minor civil division boundaries) and physical characteristics (forest cover, soils and geomorphic regions).

In addition to the 40-acre cell data base, selected studies have used both more general cell resolution (25-square kilometer, USGS quadrangle format, and one square mile) and more detailed resolution (10-acre, 2.5-acre, 100-square meter, Landsat pixel\*, 50-square meter, and smaller). The system was enhanced to allow merging of various other grid-cell data files and to capture and convert polygon data.

basic MLMIS data and specialized data from other sources have been combined to produce a variety of products for over 200 clients. Major types of studies include: facility siting (landfills, power plants) resource management (crop-land suitability, erosion/sedimentation, scenic amenity); master plans (community planning, park and wildlife areas); environmental assessment (highway corridors and transmission lines); and establishing mapping priorities (USGS topographic mapping). Until recently, efforts by system staff emphasized the development of a basic data file. Although some data may still be entered for special studies, primary emphasis is shifting to coordination with other data collection and entry programs. This is greatly enhanced in Minnesota because the Legislative Commission on Minnesota Resources requires MLMIS compatibility with all natural resource acceleration programs it funds.

\*Pixel is the unit of resolution on Landsat imagery. One pixel on Landsat 1, 2, and 3 corresponds to a ground area measuring approximately 57 by 79 meters. Synonym: Picture element.

## NASA's Proposal to Test Remote Sensing Techniques for Wetland Delineation in Alaska

State and local governments in Alaska have begun to develop data bases that address wetland inventory requirements. Federal agencies, which have had a much longer existence and an historically predominant role in Alaska land management, are somewhat further along in data base development and in experience with remote sensing applications. Traditional close cooperation and sharing enable state agencies to benefit from this experience.

NASA currently has a major opportunity to support a far-reaching technology transfer program in the State of Alaska. Working cooperatively with other federal agencies, NASA can provide timely assistance to state and local governments by transferring remote sensing technology and methods that will materially aid in carrying out mandates for statewide land planning that are a focus of national attention.

A two-year research project has been funded to develop and test several techniques of Landsat digital and computer-aided visual analysis for distinguishing wetlands from non-wetland cover types in Alaska. Test sites representing various physiographic regions of Alaska will be studied in order to develop a wetland delineation model that will apply, so far as is possible, over the majority of the state.

The project objectives will be met through the following approach. Initially, an assessment of agency needs concerning wetlands information will be conducted along with a uniform definition of wetlands. Physiographically different test sites will then be chosen and ground-truthed. To analyze these sites, several techniques will initially be employed. Among these are: Use of multi-data imagery; band ratioing; stratification; and use of ancillary data. It is anticipated that at least two of the three following Landsat data analysis systems will be employed in this effort: ARPANET/EDITOR; IDEMS; VICAR/IBIS. All results and recommendations forthcoming will be evaluated and tested in the broadest environment to determine extent of applicability. Comparisons will be made with results of integrated terrain unit mapping in the Susitna River Valley.

The State has already recognized the essential role of remote sensing in meeting its requirements and has created an institutional mechanism in the form of a Remote Sensing Task Force, established under the Alaska Land Managers Cooperative Task Force. The latter group, created by Memorandum of Agreement between the Governor of Alaska, the Secretaries of Interior and Agriculture, and the Alaska Federation of Natives, is a vehicle for cooperative efforts at solving land planning problems and includes representation of federal, state, local and Native agencies and organizations.

In 1978, the Alaska Remote Sensing Task Force initiated a comprehensive, statewide technology transfer program including such elements as needs assessment, information exchange, training activities, cooperative regional demonstration projects, and development of recommendations for the design and implementation of operational capabilities. Among its activities, the Task Force has sponsored the Alaska Cooperative Aircraft Photography Program (supported jointly by the Ames Research Center (ARC) and the Johnson Space Center (JSC)), which has a key objective of providing an initial set of high altitude color infrared photography supportive of remote sensing analysis statewide. The Task Force has identified wetlands inventory as a program element requiring applications development and specific emphasis.

NASA assistance for various elements of the state technology transfer program is separately being coordinated under the NASA/ARC Alaska Applications Systems Verification and Transfer (ASVT). This includes support for two major, multi-discipline demonstrations in the south central and interior regions of Alaska. The first major, multi-discipline demonstration is complete. The second, taking place in interior Alaska, has begun. Wetlands research is proposed as a separate element of NASA support based on the Task Force recommendation and because of requirements for further applications development identified in current analyses for the Alaska ASVT. However, the regional demonstrations and the overall state program provide a major, in-place vehicle for technology transfer.

For further information on NASA's proposal to test remote sensing techniques for wetland delineation in Alaska, contact Rikki Fowler, Ecologist, Alaska Department of Environmental Conservation, (907)274-2533.



APPENDIX B

LEGISLATIVE REVIEW OF ADMINISTRATIVE REGULATIONS

APPENDIX B  
LEGISLATIVE REVIEW OF ADMINISTRATIVE REGULATIONS

CONNECTICUT --- (Conn. Gen. St. 4-170 et seq) The Legislative Regulations Review Committee is bipartisan and composed of eight representatives and six senators. It reviews all proposed regulations of state departments and agencies and may hold public hearings thereon. The committee may give notice of approval or disapproval within 60 days (failure to act within 60 days constitutes approval). If the committee gives notice of disapproval, no agency may take action to implement the disapproved regulation. The committee reports annually to the general assembly on all disapproved regulations which, after study by an appropriate committee, may vote to sustain or reverse the disapproval. Any committee disapproval of a regulation implementing a federally subsidized or assisted program must be sustained by the general assembly or it is deemed reversed. The committee attempts to resolve questioned regulations with the agency responsible, but has disapproved several regulations each year. A 1977 law provides for a five-day period for prior review of proposed emergency regulations by the committee.

IOWA--- (Iowa Code Ann. Sec. 17A.8) A new Administrative Rules Review Committee was created in 1975, although authority for regulation review had previously existed. The new committee is composed of three members from each house and meets monthly. It is authorized to selectively review promulgated rules, but is currently reviewing all promulgated rules. The review committee may file objections to rules based on the fact they are unreasonable, arbitrary, capricious or beyond the scope of agency authority. Such objections transfer the burden of proof to the issuing agency in any legal challenge to the rule. An agency unable to sustain this burden of proof in a legal challenge may be liable for all court costs of the challenge. The Rules Review Committee may also refer a rule for consideration to the appropriate legislative standing committee at the next regular session.

MAINE--- (5M RSA c.308/2501 et seq) A law enacted by the 1977 session provides that agencies submit all current rules to the legislature by January 15, 1978 for review by the appropriate standing committees. These committees must hold public hearings and recommend to the legislature an expiration schedule for all rules. A committee may recommend immediate expiration of a current rule. The legislature must then pass bills to implement these expiration schedules. All new rules which go into effect after January 1, 1978 automatically expire five years after their effectiveness unless the legislature passes a bill terminating their effectiveness in less than five years.

MICHIGAN --- (Mich. St. Ann. 24.201 - 24.315, Act No. 108, Public Acts of 1977) The Joint Committee of Administrative Rules (three senators, five representatives) has a 60-day period in which to approve or disapprove all proposed rules. Under a 1977 law passed over the governor's veto and effective on January 1, 1978, if the committee disapproves a rule or fails to approve it within 60 days, the rule cannot be adopted by the agency unless the legislature overrules the committee action within 60 days. The state supreme court has refused to consider a request by the governor for an advisory opinion on the constitutionality of this law. In addition, opinions of the attorney general have questioned the constitutionality of legislative disapproval of rules by concurrent resolution, rather than by bill. Legislative power to review and suspend regulation during the interim is authorized in Article IV, section 37 of the state constitution. Michigan has more than 30 years experience with some type of legislative oversight of administrative regulations.

MINNESOTA --- (Minn. St. 3.965) The Legislative Commission to Review Administrative Rules, composed of five members of each house, may hold public hearings to investigate complaints concerning rules and, on the basis of testimony received, suspend any rule. In practice, however, the committee reviews all proposed rules. If a rule is suspended by the committee, such action must be sustained by the legislature at its next session. Before the committee suspends any rule, it shall submit it to the appropriate standing committees for their review and recommendation. Emergency rules are effective for only 90 days, during which time they must be repromulgated under the regular procedure in order to remain in effect beyond that time.

NEW HAMPSHIRE---(NH RSA Sec. 541 A) In 1977, the legislature enacted a law creating a Joint Committee on Review of Agencies and Programs. The committee will have the power to sunset agencies and review their existing rules. In addition, the law provides the standing committees the power to review rules prior to their effective date and may send the rules back to the agency if the rules are not in the proper format.

NEW YORK---(NYSA. Legislative Law, Art. 5-B, Secs. 86-88) A 1978 law formally created the Administrative Regulations Review Commission. The Commission, originally created by joint resolution in 1977, is composed of three senate and three assembly members. Agencies must file their proposed rules with the commission at least 21 days prior to effectiveness. The commission has the power to examine agency rules as to their statutory authority, their compliance with legislative intent, their impact on the economy and government operations, their impact on affected parties. In addition, the commission may hold hearings and has been granted subpoena power.

APPENDIX C-1

CLASSIFICATION SYSTEM FOR FRESHWATER WETLANDS IN  
NEW YORK STATE

## Appendix C-1

### CLASSIFICATION SYSTEM FOR FRESHWATER WETLANDS IN NEW YORK STATE

Class I wetlands. A wetland shall be a Class I wetland if it has any of the following seven enumerated characteristics:

- (1) it is a classic kettlehole bog;
- (2) it is resident habitat of an endangered or threatened animal species;
- (3) it contains an endangered or threatened plant species;
- (4) it supports an animal species in abundance or diversity unusual for the state or for the major region of the state in which it is found;
- (5) it is tributary to a body of water which could subject a substantially developed area to significant damage from flooding or from additional flooding should the wetland be modified, filled, or drained;
- (6) it is adjacent or continuous to a reservoir or other body of water that is used primarily for public water supply, or it is hydraulically connected to an aquifer which is used for public water supply; or
- (7) it contains four or more Class II characteristics.

Class II wetlands. A wetland is a Class II wetland if it has any of the following seventeen characteristics:

- (1) it is an emergent marsh in which purple loosestrife and/or reed (phragmites) constitutes less than two-thirds of the covertype;
- (2) it contains two or more wetland structural groups
- (3) it is contiguous to a tidal wetland;
- (4) it is associated with permanent open water outside the wetland;
- (5) it is adjacent or contiguous to streams classified C(t) or higher under article 15 of the environmental conservation law;
- (6) it is traditional migration habitat of an endangered or threatened animal species;
- (7) it is resident habitat of an animal species vulnerable in the state;
- (8) it contains a plant species vulnerable in the state;
- (9) it supports an animal species in abundance or diversity unusual for the county in which it is found;
- (10) it has demonstratable archaeological or paleontological significance as a wetland;
- (11) it contains, is part of, owes its existence to, or is ecologically associated with, an unusual geological feature which is an excellent representation of its type;
- (12) it is tributary to a body of water which could subject a lightly developed area, an area used for growing crops for harvest, or an area planned for development by a local planning authority, to significant damage from flooding or from additional flooding should the wetland be modified, filled, or drained;
- (13) it is hydraulically connected to an aquifer which has been identified by a government agency as a potentially useful water supply;
- (14) it acts in a tertiary treatment capacity for a sewage disposal system;
- (15) it is within an urbanized area;
- (16) it is one of the three largest wetlands within a city, town, or New York City borough; or
- (17) it is within publicly owned recreation area.

Class III wetlands. A wetland is a Class III wetland if it has any of the following fifteen characteristics:

- (1) it is an emergent marsh in which purple loosestrife and/or reed (phragmites) constitutes two-thirds or more of the cover type;
- (2) it is a deciduous swamp;
- (3) it is a shrub swamp;
- (4) it consists of floating and/or submergent vegetation;
- (5) it consists of wetland open water;
- (6) it contains an island with an area or height above the wetland adequate to provide one or more of the benefits described;
- (7) it has a total alkalinity of at least 50 parts per million;
- (8) it is adjacent to fertile upland;
- (9) it is resident habitat of an animal species vulnerable in the major region of the state in which it is found, or it is traditional migration habitat of an animal species vulnerable in the state or in the major region of the state in which it is found;
- (10) it contains a plant species vulnerable in the major region of the state in which it is found;
- (11) it is part of a surface water system with permanent open water and it receives significant pollution of a type amenable to amelioration by wetlands;
- (12) it is visible from an interstate highway, a parkway, a designated scenic highway, or a passenger railroad and serves a valuable aesthetic or open space function;
- (13) it is one of the three largest wetlands of the same cover type within a town;
- (14) it is in a town in which wetland acreage is less than one percent of the total acreage; or
- (15) it is on publicly owned land that is open to the public.

Class IV wetlands. A wetland is a Class IV wetland if it does not have any of the characteristics listed as criteria for Class I, II or III wetlands. Class IV wetlands will include wet meadows and coniferous swamps which lack other characteristics justifying a higher classification.

APPENDIX C-2

EXPLANATION OF CLASSIFICATION CHARACTERISTICS FOR FRESH  
WATER WETLANDS IN NEW YORK STATE

## Appendix C-2

### EXPLANATION OF CLASSIFICATION CHARACTERISTICS FOR FRESH WATER WETLANDS IN NEW YORK STATE

This section describes characteristics and their associated benefits used in classifying wetlands.

(a) Cover types. The different wetland cover types described in this subdivision provide wetland benefits to varying degrees. In order for a wetland to be considered to be of a given cover type and classified accordingly, that cover type should constitute at least 50 percent of the area of the wetland. However, if no single cover type constitutes 50 percent or more of the wetland area, this aspect of the wetlands classification is determined by adding up the areas of all the separate cover types in each class and then assigning the wetland to the class that represents the largest proportion of the wetland's area. The only Class II cover type is emergent marsh in which purple loosestrife and/or reed (phragmites) constitutes less than two-thirds of the cover type; Class III cover types are emergent marsh in which purple loosestrife and/or reed constitutes two-thirds or more of the cover type, deciduous swamp, shrub swamp, floating and/or submergent vegetation, and wetland open water; and Class IV cover types are wet meadow and coniferous swamp.

(1) Wet meadow. This consists of such plants as sedges, rushes, coarse grasses, and sometimes cattails. The soil is usually saturated with water for a significant part of the growing season. Vegetation tends to grow in clumps or tussocks. Cattails, if present, tend to grow between the clumps. In agricultural areas, wet meadow is usually a cleared but uncultivated parcel; often it is pastured. If the land is pastured, the clumps are more pronounced due to trampling by livestock. Wet meadow may occur within or at the edges of a hayfield and may be mowed, depending upon the degree of wetness. Old beaver meadows and floodplains may contain wet meadow vegetation. Standing water is often present during wet periods.

Wet meadow, when associated with other wetland cover types, is valuable for wildlife, especially for nesting wetland birds. When associated with certain other wetland cover types or with open water, wet meadow may be valuable for fish spawning. When not associated with other wetland cover types, however, wet meadow is likely to be of relatively low value.

(2) Emergent marsh. This consists of such plants as cattails, purple loosestrife, swamp loosestrife, arrowheads, reeds, bur-reeds, pickerel-weed, wild rice, water plantain, bulrushes, and arrow-arum. These are herbaceous plants encroaching on water areas and flooded with standing water much of the year.

Emergent marsh is generally the most valuable individual cover type. The emergent vegetation itself provides nesting habitat, food, and cover. Frequently, emergent vegetation produces the largest annual increase in natural organic materials of any cover type, providing non-polluting nutrients to food chains. An emergent marsh is usually different in physical structure from surrounding areas and therefore provides habitat diversity. An exception to the high value assigned to emergent marsh may occur where purple loosestrife or reed (phragmites) is dominant, in that it constitutes two-thirds or more of the cover type. In this case, a wetland is a Class III wetland.



(3) Deciduous swamp. This consists of live deciduous trees over 4.5 meters (approximately 15 feet) in height. If not totally flooded, the terrain is hummocky. The trees include, but are not limited to, American elm, red maple, silver maple, red ash, black ash, swamp white oak, and willows. Deciduous swamps will generally be flooded or saturated during the spring and early summer, but are likely to appear dry toward the end of summer and in the fall.

Deciduous swamp is relatively valuable because it is frequently used by nesting waterfowl and is also heavily used by songbirds and other wildlife.

(4) Coniferous swamp. This consists of live coniferous trees over 4.5 meters (approximately 15 feet) in height. Some of the coniferous trees most commonly found in wetlands are black spruce, white cedar, red spruce, balsam fir, and American larch. Flooded conifers usually grow in hummocky terrain. The trees tend to grow out of the drier hummocks with pockets of water forming between the hummocks.

The value of coniferous swamp for wildlife is considered to be relatively low, although coniferous swamp can provide important winter cover for deer, and habitat for varying hare.

(5) Shrub swamp. This cover type is found in a variety of areas including floodplains; frost pockets; edges of ponds, lakes, and bogs; and in association with hillside seeps. Woody vegetation is classified as shrub swamp if it is 4.5 meters (approximately 15 feet) or less in height. Species include: alders, willows, leatherleaf, bog rosemary, sweet gale, buttonbush, highbush cranberry, and red osier dogwood. Also, sphagnum moss in bog mats usually occurs in association with shrub species.

The value of shrub swamp for fish and wildlife is variable, but shrub swamp can provide some of the values of emergent marsh or deciduous swamp: it is likely to have a structure different from surrounding areas and may supply significant nesting and other wildlife uses.

(6) Floating and submergent vegetation. Floating wetland vegetation may be tree-floating, such as duckweed and watermeal, or rooted with floating leaves, such as waterlily, watershield, and spatterdock. Submergent plants, such as pondweeds, naiads, coontail, water milfoil, wild celery, muskgrass, stonewort, water smartweed, and bladderworts, normally grow beneath the surface of the water.

These cover types can be important food sources for waterfowl and frequently are valuable areas for fish spawning and nurseries.

(7) Wetland open water, including open water with dead trees and open water that occasionally exposes unvegetated mud flats. Unvegetated open water is part of a wetland as a wetland cover type if it is substantially enclosed by wetland vegetation and is no larger than 2.5 hectares (approximately 6.2 acres). If the body of open water that is substantially enclosed by wetland vegetation is larger than 2.5 hectares (approximately 6.2 acres), then only that portion of the open water that is within 50 meters (approximately 165 feet) of the wetland vegetation is considered to constitute a wetland cover type and to be part of a wetland.

When in close conjunction with wetland vegetation, open water can be of considerable value as fish and wildlife habitat.

(b) Ecological associations. A variety of significant ecological associations may occur in wetlands. Wetlands having an association of substantially different kinds of physical or vegetative structures have special ecological value, especially for wildlife and fish. Association with particular non-wetland features may be important in defining wetland benefits. In addition, the visual diversity provided serves a valuable aesthetic function. The nature and significance of these associations are set forth in this subdivision.

(1) Two or more structural groups. Three groups of wetland vegetative structures can be identified. In order to be significant enough to be considered a factor in classifying a wetland according to this Class II characteristic, each structural group must constitute at least a particular minimum percentage of the area of the wetland.

(i) The herbaceous structural group consists of the cover types made up of herbaceous vegetation which emerges above the surface of the water or soil. These emergent marsh and/or wet meadow cover types must constitute at least 25 percent of the area of the wetland.

(ii) The woody structural group consists of cover types of generally woody vegetation. These deciduous swamp, coniferous swamp, and/or shrub swamp cover types must constitute at least 25 percent of the area of the wetland.

(iii) The water structural group consists of cover types in which the surface of the water is apparent. These submergent and floating vegetation and/or wetland open water cover types, including open water with dead trees and open water that occasionally exposes unvegetated mud flats, must constitute at least 15 percent of the area of the wetland.

For example, a wetland which is 80 percent shrub swamp (woody structural group) and 20 percent submergent and floating vegetation (water structural group) has this Class II characteristic. A wetland which is 45 percent deciduous swamp (woody structural group), 35 percent coniferous swamp (also woody structural group, and 20 percent wet meadow (herbaceous structural group) does not have this Class II characteristic because, although the woody structural group constitutes well over its minimum 25 percent of the wetland, the herbaceous structural group constitutes less than its minimum 25 percent of the wetland.

The physical structure of each of these three groups is substantially different from the structure of each of the other two. The presence of this characteristic increases the value of a wetland as fish and wildlife habitat because each of the different groups can support species not found in the others, thus increasing the variety of species on the wetland as a whole. In addition, those species which need two different structural groups to meet all of their requirements can only exist when both groups are present. The presence of different groups together also provides visual variety, thus enhancing aesthetic benefits.

(2) Classic kettlehole bog. Classic kettlehole bogs are wetlands which are at least 75 meters (approximately 246 feet) in diameter within a closed drainage basin, having a minimal or no surface inlet or outlet. These bogs have complete or virtually complete concentric zones of differing vegetative cover types. The innermost zone of the bog is open water that is of pH 5.00 or lower and is typically anoxic and dark brown. Surrounding this is a floating mat of sphagnum mosses, liverwort, and shrubby heath plants; this mat is surrounded in turn by coniferous swamp above deep deposits primarily of partly decayed sphagnum mosses.

Wetlands of this type are very rare, as are many of the life forms within them, and therefore they contribute to the ecological, geological, and aesthetic diversity of the state. This in turn provides educational and scientific research benefits.

(3) Wetlands contiguous to tidal wetlands. These are freshwater wetlands which abut the landward boundary of tidal wetlands shown on the tidal wetlands inventory maps promulgated pursuant to the environmental conservation law.

Freshwater wetlands contiguous to tidal wetlands can provide unusual fish and wildlife habitat benefits. The perpetuation of freshwater wetlands associated with tidal wetlands is likely to be essential to the protection of the tidal wetlands. These freshwater wetlands can purify water flowing into tidal wetlands and also can act with tidal wetlands to protect adjacent property against storm tides.

(4) Associated with permanent open water outside the wetland. A wetland may include open water. However, to be considered under this characteristic, a wetland must be associated with permanent open water which exists outside of the wetland. This association must be one of close proximity, with water flow between the wetland and the open water at some time during the year. The wetland must be contiguous to the open water, or, if it is separated, the separation must be only a narrow strip of land, such as a barrier beach or a railroad bed.

Wetlands associated with open water have many special values. Some wildlife and fish usually found in open water must spend part of their life cycle in wetlands for reproduction, food and cover. The wetlands are also vital in providing natural nutrients to open water ecosystems. They may cleanse water entering the open water body and thus protect the quality of the open water. The associated open water often provides recreational and educational opportunities dependent upon these wetland functions.

(5) Adjacent or contiguous to streams classified C(t) or higher under article 15 of the environmental conservation law. Wetlands may be critical to protecting the quality of these streams. They may remove sediment and other pollutants, stabilize water flow, and help to maintain water temperatures required by desirable fish species.

(6) Island present within wetland. Islands provide nesting habitat and refuge for wildlife. They provide visual variety and interest and can be the focus of recreational and educational activities.

(c) Special features. Wetlands may contain particularly critical or fragile resources that require special protection. They may also contain other special features which enhance their benefits. Because some of these features are described in relation to major regions of the state, a definition of those major regions is provided in paragraph (1).

(1) The major regions of the state are shown on the map included in this subdivision. More detailed delineations of the major regions shown on that map are available in the regional offices of the department. Where a wetland is near a major region border, the wetland's region is considered to extend into the adjacent region(s) to a distance of 15 kilometers (approximately 9 miles) from the wetland. However, this modification of regional borders does not apply to the borders of the metropolitan region. The major regions are:

- (i) Coastal plain (Long Island outside of the New York portion of the New York-Northeastern New Jersey urbanized area, as defined by the United States Bureau of the Census;
- (ii) Metropolitan (the New York portion of the New York-Northeastern New Jersey urbanized area);
- (iii) Hudson-Mohawk (in the Hudson Valley, north of the metropolitan region, from the eastern border of the state to the Appalachian highlands; in the Mohawk Valley, from the Appalachian highlands to the Adirondacks);
- (iv) Lake plain (a narrow strip bordering Lake Erie; south of Lake Ontario to the Appalachian highlands; east of Lake Ontario to the Adirondacks; north of the Adirondacks to the St. Lawrence River or to the Canadian border; a narrow strip bordering Lake Champlain);
- (v) Adirondack (within the Adirondack forest park and bordered by the lake plain and Hudson-Mohawk regions);
- (vi) Appalachian highland (from the Pennsylvania and New Jersey borders to the lake plain and Hudson-Mohawk valleys).

(2) Wetlands containing resident animal habitat. This means habitat of year-round resident animal species, or habitat of migratory species during their breeding or wintering periods.

(3) Wetlands containing traditional migration habitat of an animal species. This is habitat used by a species in moving from breeding to wintering habitat in the late summer and fall, and from wintering to breeding habitat in the late winter and spring. Such use must be on a recurring basis so that there are grounds to believe that it will continue annually. This characteristic does not apply to the occasional occurrence of a stray or wandering individual animal during the migration period.

(4) Endangered or threatened species. This is a species or subspecies (or botanical "variety" where "variety" is used as the equivalent of the zoological "subspecies") of plant or animal (vertebrate or invertebrate) which is considered to be of statewide significance because it has been identified as endangered or threatened by the United States Fish and Wildlife Service or in regulations promulgated by the department pursuant to the environmental conservation law, in the case of animals, or in additions to this Part after public hearing, in the case of plants.

(5) Vulnerable species. This is a species or subspecies (or botanical "variety" where "variety" is used as the equivalent of the zoological "subspecies") of plant or animal (vertebrate or invertebrate):

- (i) for which extirpation from the state or a major region of the state is likely, but the species as a whole is not in jeopardy; or
- (ii) that is in such small numbers throughout the state or a major region of the state that it could be extirpated if recent trends degrading or diminishing its habitat continue; or
- (iii) whose range is restricted in the state or a major region of the state and it or its habitat has a low tolerance for disturbance.

Vulnerable species are identified by the department in additions to this Part after public hearing.

(6) Wetlands having animal species in unusual abundance or diversity (statewide or regional). Certain wetlands are unusual ecosystems because they are sites of large heronries or other colonial nesting; are regularly and intensively used by raptors, waterfowl, or other migrating birds; are in major deer winter concentration areas; support valuable and intensive fish spawning; are extremely productive in breeding ducks, geese, shore birds, wading birds, and/or furbearers; or otherwise contain an unusually high abundance or diversity of wildlife or fish. In order to be considered under this characteristic, the abundance and/or diversity must be actual, not merely potential or predicted; with the expectation, based on the department's knowledge of existing conditions and fish and wildlife behavior, that the abundance and/or diversity is not merely a one-year or transitory phenomenon. However, this characteristic does not apply to domestic or invertebrate species or to disease-bearing or other noxious species such as the Norway rat.

(7) Wetlands having animal species in unusual abundance or diversity (county). The same values described under paragraph (6) above apply here, except that they are lower because the basis for assessing abundance or diversity is county-wide rather than regional or statewide.

(8) Wetlands having demonstrable archaeological or paleontological significance as wetlands. Some existing wetlands were important sites of native American activities such as food-gathering, or supported concentrations of life forms now long extinct, and the natural conditions in wetlands enabled the evidence of these functions to be preserved. Such areas now are valuable resources for education and scientific research examining the importance of wetlands to human and animal life over time. Damage to such wetlands could significantly diminish those resources.

(9) Wetlands having geological significance. Some wetlands are associated with unusual geological features which are excellent representations of their type. Examples of such features might be lakeshore barrier beaches, sand dunes, eskers, or pine barrens. Where wetlands contain, are part of, owe their existence to, or are ecologically associated with such a feature, they comprise integral parts of unusual ecological communities. Damage to such wetlands may therefore result in the loss of unusual species of fish, wildlife, or vegetation and is likely to significantly diminish the state's or a major region's ecological, educational, or aesthetic resources or diminish the variety of the state's or a major region's landforms.

(10) Wetlands having a total alkalinity of at least 50 parts per million. A relatively high total alkalinity has value for wildlife and fish for at least two reasons. It is a measure of the capacity of wetlands to avoid acidic conditions and as such deters the accumulation of substances harmful to the growth of vegetation that provides good wildlife habitat. Total alkalinity is also a general indication of the natural fertility of the substrate underlying the wetland. Generally, a more naturally fertile substrate will support better habitat.

(11) Wetlands adjacent to fertile upland. This characteristic is identified by soil tests or by soils maps. Upland soils in the immediate vicinity of a wetland are an indication of the fertility of the wetland substrate. In general, those soils in the immediate vicinity of a wetland are an indication of the fertility of the wetland substrate. In general, those soils described by the United States Soil Conservation Service as "high base soils" (pH 5.6 or higher) will be considered fertile for the purposes of this Part.

The value of fertile soils is similar to the values described in paragraph (10) above: generally, a more naturally fertile substrate will support better habitat for fish and wildlife.

(u) Hydrological and pollution control features. Some wetlands provide significant hydrological and pollution control benefits. The major features of wetlands providing those benefits are set forth in this subdivision.

(1) Wetlands may provide a drainage basin with a natural stormwater retention facility. This flood storage function may slow the downstream movement of the flood crest and lower its peak elevation. The flood control benefits of a wetland generally increase with its size relative to the size of the drainage area tributary to the flood-endangered locale. The loss of a significant area of wetland within a drainage basin may therefore aggravate flooding, erosion, and sedimentation in the immediate downstream area.

(2) The protection of wetlands adjacent or contiguous to reservoirs or to other bodies of water used primarily for public water supply may be essential to preserving that supply. Disturbance or loss of these wetlands can lower water quality and cause health problems to the water users.

(3) Some wetlands that are part of a surface water system with permanent open water receive pollutants. By slowing runoff, adding water to the pollutants, and spreading water shallowly over a large area, these wetlands may remove sediment, oxidize or precipitate pollutants, and dilute wastewater, thus cleansing water in the surface water system. In some cases, such wetlands provide tertiary treatment in relation to sewage disposal systems. However, these beneficial characteristics are considered for classification only if the pollution is generally of a kind amenable to assimilation or amelioration by wetlands.

(4) Some wetlands are underlain by deposits of pervious earth materials which serve to hydraulically connect them to aquifer systems so that some of the water from such wetlands percolates into the aquifers and recharges them. For infiltration of water from a wetland to be of an amount significant enough to provide a groundwater supply source, and therefore to be

either a Class I or II characteristic, the pervious earth materials underlying the wetland must be more than three meters (approximately ten feet) thick. Some of the more important aquifers in the state have already been identified by various agencies, such as the U.S. Geological Survey, the Department of Environmental Conservation, the State Department of Health, and various county and regional planning agencies.

Preservation of groundwater recharge areas is critical to the protection of the aquifers and the water supply. Recharge to groundwater systems generally takes place during times of the year when little foliage (which discharges water via transpiration) is present. At these times, as well as other times, wetlands can recharge aquifers if the soils at their bottoms are so pervious as to allow infiltration. For example, although the soil types underlying wetlands are usually peat, muck, marl, or clay, none of which is very pervious, wetland overflow lands in floodplains may be underlain by sandy or gravelly alluvial soils. These wetlands, even if not very large, can serve to restore significant amounts of water to aquifers, thereby allowing wells to continue yielding water.

(e) Distribution and location. The distribution and location of wetlands are important considerations in determining the benefits of particular wetlands as open space and for recreational, aesthetic, and educational purposes. Nothing in this Part or in the Act, however, requires a landowner to open land to public access for such purposes.

(1) Within urbanized areas. "Urbanized areas" are defined by the United States Bureau of the Census, and consist of a central city, or cities, and surrounding suburban areas. According to that definition, the central city must have a population of 50,000 or more, and surrounding closely settled areas are included if these are:

- (i) incorporated places of 2,500 inhabitants or more;
- (ii) incorporated places with fewer than 2,500 persons, provided that each has a closely settled area of 100 housing units or more;
- (iii) small land parcels normally less than one square mile in area having a population density of 1,000 inhabitants or more per square mile; or
- (iv) other similar small areas in unincorporated territory with lower population density when these areas serve to complete urban-suburban community boundaries.

For the purposes of this Part, the urbanized areas of the state are listed by the United States Bureau of the Census as follows: New York-Northeastern New Jersey (the New York State portion), Buffalo, Albany-Schenectady-Troy, Binghamton, Rochester, Syracuse, and Utica-Rome.

In addition, incorporated cities not covered by the United States Bureau of the Census definition are included for the purposes of this Part, but only the city proper, and not surrounding areas. These are: Amsterdam, Auburn, Batavia, Beacon, Canandaigua, Corning, Cortland, Dunkirk, Elmira, Fulton, Geneva, Glens Falls, Gloversville, Hornell, Hudson, Ithaca, Jamestown, Johnstown, Kingston, Little Falls, Lockport, Mechanicville, Middletown, Newburgh, Norwich, Ogdensburg, Olean, Oneida, Oneonta, Oswego, Plattsburgh, Port Jervis, Poughkeepsie, Salamanca, Saratoga Springs, and Watertown.

Because of their rarity, their distinctiveness from urban surroundings, and their proximity to large numbers of people, wetlands in urbanized areas can provide unusually important natural, recreational, educational, scientific, open space, and aesthetic benefits.

(2) Visible from an interstate highway, a parkway, a designated scenic highway, or a passenger railroad and serves a valuable aesthetic or open space function. The following criteria will be considered in determining the applicability of this characteristic: the visibility of the wetland or of the wildlife on the wetland, the size of the wetland, and the topography and the variety of vegetative types in and surrounding the wetland. As a guideline, the wetland should be within one-half kilometer (approximately one-third mile) from the transportation corridor, although the criteria may justify a reduction or increase in this distance.

For many people who commute on high use transportation corridors, the open space, visual variety, and wildlife viewing opportunities provided by wetlands are aesthetically important benefits.

(3) One of the three largest wetlands within a city, town, or New York City borough; one of the three largest wetlands of the same cover types within a town; in a town in which wetland acreage is less than one percent of the total acreage. The rarer wetlands are, and the rarer any one cover type is in a locality, the more valuable are the recreational and educational opportunities and open space and aesthetic benefits provided by the wetlands or cover types which remain. In addition, the retention of a base of wetlands and wetland cover types in a locality can help to perpetuate fish and wildlife diversity in that locality. The size of a wetland can also be significant because many species have substantial threshold space requirements and are unable to make use of smaller areas. In addition, disturbance of wetland wildlife by activities outside the wetland or adjacent area can be buffered to some degree in larger wetlands.

(4) Within a publicly owned recreation area. These wetlands provide many recreational and educational opportunities.

(5) On publicly owned land that is open to the public. Many of the recreational, educational, scientific, aesthetic, and open space benefits of wetlands cited in section 24-0105 of the act will usually be most fully realized on publicly owned lands. Such lands may have greater public use than private lands.



## BIBLIOGRAPHY

- Congressional Research Service - Library of Congress "Memo to Honorable Bob Livingston from Jeffrey Zinn". Washington, D.C. (August 1980)
- Connecticut Department of Environmental Protection, ed. "Construction in Water Courses: Seasonal Changes" Phil Moreshi in Wetlands Advisor 3 Hartford, Connecticut (March 1980)
- "National Wetland Inventory" Wetland Advisor 4 Hartford, Connecticut (August 1980)
- Connecticut Department of Environmental Protection, ed. Water Resources Unit, Wetlands Management Section. Annual Report July 1, 1979 - June 30, 1980, Hartford, Connecticut 1980
- Council of Environmental Quality, "Our Nations Wetlands: An Interagency Task Force Report" by Elinor Lander Holwitz 1978: 5-7
- Iowa Conservation Commission, "Outline for the Protected Water Area General Plan, Des Moines, Iowa. June 1980
- Iowa Conservation Commission, "Preliminary Study for Legislation Protecting Iowa's Water Areas." Des Moines, Iowa
- Iowa Conservation Commission, ed. "Origin of the PWA Study" in Iowa Protected Water Areas Study. Des Moines, Iowa (April 1979)
- "Protected Water Areas Bill is Under Construction" in Iowa Protected Water Areas Study. Des Moines, Iowa (October 1979)
- "Introduction to a PWA Bill Delayed" in Iowa Protected Water Areas Study. Des Moines, Iowa (January 1980)
- "Protected Water Area General Plan is Being Written" in Iowa Protected Water Areas Study. Des Moines, Iowa (March 1980)
- Larson, Joseph, ed. "Wetlands Management" in Water Research in Action: Technology Transfer from State Water Resources Institutes Vol. 4 (January/-February 1980) Texas Water Resources Institute, College Station, Texas
- Massachusetts Department of Environmental Quality Engineering, ed. "Questions and Answers on the Massachusetts Wetlands Protection Act". Boston, Massachusetts. 1979
- National Aeronautics and Space Administration, ed. "Alaska Wetlands Deliniation Program" in Research and Technology Objectives and Plans. Moffet Field, California. 1980
- New York Department of Environmental Conservation, ed. "Fresh Water Wetlands Regulations" by Eric Fried in The Conservationist May-June 1980. Albany, New York

PAGE 14 INTENTIONALLY LEFT

----- . "Wetlands Inventory is Completed" by Nancy Cole in The Conservationist  
May-June 1980 Albany, New York

Smith, Wendy ed. "State Wetland and Floodplain Regulatory Programs" National Wetlands Newsletter 1 (February 1979) : 5-8

Tessar, Paul A. ed. "The Minnesota Land Management Information Center." Remote Sensing Newsletter 2 (October 1978)

Tessar, Paul A. and Caron, Loyola M., eds. "The Michigan Resource Inventory Act." N.R.I.S. Newsletter 3 (February/March 1980)

U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, "Strengthening State Wetland Regulations." by Jon A. Kusler November 1978 (FWS/DBS - 78/98)

1/11/81

CONF. 12. 1981